NATIONAL CAR BUILDER

VOLUME XIII.
NUMBER 5.

DEVOTED TO THE INTERESTS OF RAILWAY ROLLING STOCK.

$1.00 PER ANNUM
SINGLE NUMBERS, TEN CENTS.

NEW YORK:
Morse Building, 140 Nassau St.

MAY, 1882.

Entered at the Post Office at New York, N. Y., as Mail Matter of the Second Class.

CHICAGO:
144 N. Clark Street.

Boston. STANDARD CAR VARNISHES. Boston.
BURBANK, RYDER & DAMON.
Boston. Boston.

Plain and Decorated Leathers
FOR
UPHOLSTERING
Railroad Cars.
Panel and Ceiling Decoration for Finest Palace Cars.
Master Car-Builders and Purchasing Agents write to
CHAS. R. YANDELL & CO.,
6 East Eighteenth Street, New York.

CLIFF & RIGHTER CO.
(Limited),
MANUFACTURERS OF
SPRINGS,
5 Dey St., New York.
FACTORY, OSWEGO, N. Y

GEO. WESTINGHOUSE, Jr., President. T. W. WELSH, Superintendent. JOHN CALDWELL, Treasurer. W. W. CARD, Secretary. H. H. WESTINGHOUSE, General Agent.
THE WESTINGHOUSE AIR-BRAKE COMPANY,
Pittsburgh, Pa., U. S. A.,
MANUFACTURERS OF THE
WESTINGHOUSE AUTOMATIC BRAKE,
WESTINGHOUSE LOCOMOTIVE DRIVER BRAKE,
VACUUM BRAKES (Westinghouse & Smith Patents),
WESTINGHOUSE AIR BRAKE.
Particular attention is called to the "AUTOMATIC" and "LOCOMOTIVE DRIVER BRAKES," now being tested and adopted by the prominent lines.
With the "DRIVER BRAKE" the engineer can handle an ordinary freight train better than with brakemen. The saving in car wheels and wages will therefore be apparent. On shifting or yard engines it is invaluable.
The "AUTOMATIC" has proved itself to be the most efficient train and safety brake known. Its application is instantaneous; it can be operated from any car in the train, if desired, and should the train separate, or a hose or pipe fail, it applies automatically. A GUARANTEE is given customers against LOSS from PATENT SUITS on the apparatus sold them.
FULL INFORMATION FURNISHED ON APPLICATION.

GEORGE WESTINGHOUSE, Jr., President. C. H. JACKSON, General Manager. RALPH BAGALEY, Vice-Pres. and Treas. ASAPH T. ROWAND, Secretary. HENRY SNYDER, General Agent.
THE UNION SWITCH AND SIGNAL CO.,
A CONSOLIDATION OF
The Union Electric Signal Co., of Boston, Mass., and of the Interlocking Switch & Signal Co., of Harrisburg, Pa.
Sole Owners and Manufacturers of the only Practically Successful System of
OPERATING RAILROAD SIGNALS AUTOMATICALLY,
Also of Apparatus for Operating and Interlocking Switches, Signals and Gates by Levers, Hydraulics, Pneumatics or Electricity. Also Manufacturers of FROGS, CROSSINGS, SWITCHES AND SWITCH STANDS. Plans, estimates and detailed descriptions, together with references to apparatus in practical operation, will be furnished upon application. Address all communications to
THE UNION SWITCH AND SIGNAL CO.,
PITTSBURGH, PA.

GEORGE WESTINGHOUSE, JR., President. RALPH BAGALEY, Secretary and Treasurer. H. H. WESTINGHOUSE, Superintendent.
THE WESTINGHOUSE MACHINE COMPANY.
General Sales Offices: 92 and 94 Liberty St., New York.
Works: 24th and 25th St. and Liberty Ave., Pittsburgh, Pa.
Manufacturers of THE WESTINGHOUSE STEAM ENGINE, THE ALDEN CRUSHER AND PULVERIZER, DAMASCUS BRONZE. See illustrated advertisement on page xx.

Warranted Superior to any Steel in the Market, either English or American, for every purpose. Send for Circular and Price List.
CHROME CAST STEEL.
CHROME STEEL WORKS,
Kent Av. & Keap St., Brooklyn, E.D., N.Y.

FOR SALE.—A DANIEL PLANER; Richardson, Merriam & Co.'s make; planes 18 inches thick by 26 inches wide and 18 feet long; in first-class condition; gearing extra heavy. Also, a Richards, London & Kelly 3-side iron, dimension planer; planes 11 inches thick by 17 inches wide and 20 feet long, in perfect order. Address "PLANER," care of *Railroad Gazette*, 73 Broadway, New York.

WANTED.—AN EXPERIENCED draughtsman on fine car-work. Address, giving full particulars "MANUFACTURER," care of NATIONAL CAR-BUILDER, 5 Dey Street, New York.

100 SECOND-HAND BOX CARS
50 For Immediate Delivery.
All in First-class Order.
Full particulars on application.
THOS. B. INNESS & CO.,
55 & 57 Pine St., N. Y.

BOUND VOLUMES OF
THE
National Car-Builder
FOR 1881
NOW READY. PRICE, $3.00.
NATIONAL CAR-BUILDER
5 Dey St., N. Y.

CAR-BUILDER SUPPLEMENT AND EXPORT EDITION,
READY JUNE 1,
With complete lists of Car-Builders, Wheel, Axle, Spring and Locomotive Builders of the United States and Canada, together with all the Street Railways of America and Canada; their officers' names, number of cars, horses and gauge, and all the West Indian, Central and South American Railroads; their officers' names, number of cars, locomotives and length of roads. Advertising rates given on application.
Price 25c. a Copy. Address, National Car Builder, New York.

THEY ARE THE BEST AND CHEAPEST.
STEWARTS BRUSHES
WE MANUFACTURE
ALL KINDS OF BRUSHES, AND MAKE A SPECIALTY OF RAILROAD AND LARGE MANUFACTURERS' TRADE.
We warrant every brush we make to be full size, best quality, and to give entire satisfaction until worn out, not get stiff when worn only half way. If you use them once you will have no other.
STEWART BROS. CO., Pittsburgh, Pa

CAR GLASS
A SPECIALTY.
Plate Glass 1-8, 3-16, 1-4 thick.
Crystal Plate 1-8 thick,
Double Thick French.
Crystal Sheet Glass,
26 oz. English Glass.
Double Thick American.
All kinds of ORNAMENTAL GLASS for Drawing room Cars, Sleepers, etc., etc. Ordinary Window, Rough and Ribbed Glass, for Depots, Shops, etc., etc. Colored Glass for Signals, etc.
Quotations, Samples and Designs sent on application.
HOLBROOK BROTHERS, 87 and 89 BEEKMAN STREET, NEW YORK.

JOURNAL OF THE ASSOCIATION OF ENGINEERING SOCIETIES.
$3 A YEAR; 30c. A NUMBER.
H. C. PROUT Secretary Board of Managers, 12 Barclay Street, New York.
CONTENTS—No. 1. Experiments on Percolation of Water, with Discussion. Memoir upon Steam Engines. Explosions of Flour Dust. Hudson River Tunnel. Street Pavements. Association and Society Proceedings.
CONTENTS—No. 2. Water Lifter, Boisé City, Idaho. Estimation of Distances by Time in Riding. Tables for Determining the Proper Sizes of Sewers. Experiments with a Gas Engine. Railway Water Supply and the Haggas Elevator. Arching Wooden Howe Trusses—Observation on Wooden Bridges. Deflections of the Howe Truss and Parabolic Bowstring. Society Proceedings.
CONTENTS—No. 3. Some remarks on Tastes and Odors of Surface Waters. Graphical Method of Studying Efficiency of Water Distribution Systems and Performances of Fire Engines. Tests of Completed Compression Members, with Reflections upon their Details. Water Waste and Water Meters. The Rise and Fall of a Railroad Company, 1837-42. Society Proceedings.
WITH NUMEROUS DRAWINGS.
These papers are all by practical and known engineers. A few advertisements will be inserted at invariable rates.

SAND-BLAST PROCESS FOR SHARPENING FILES.
Files may be several times re-sharpened, making a saving of 50 to 60 per cent., and again of 33 1-3 per cent. in amount and quality of work by using sharp files. Its worth certified to by well-known companies. Apparatus erected on trial. Address SAND BLAST FILE SHARPENING CO., WILMINGTON, DEL.

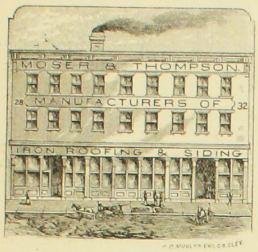
R. T. WHELPLEY,

GENERAL WESTERN AGENT

Hamilton Rubber Co.

RUBBER AND LEATHER BELTING, Packing, Rubber, Linen and Cotton Hose, Raw-Hide Lace Leather, Car Springs, Mats, etc. Also manufacturers of the celebrated DOUBLE-TUBE AIR BRAKE HOSE and "HERCULES" STEAM FIRE ENGINE HOSE. Write for Price-List and Discounts.

R. T. WHELPLEY,
131 and 133 Lake Street, Chicago.



The best material in use for covering Roofs and sides of Railroad Buildings, Car Shops, etc.

GENERAL AGENTS FOR IRON ORE PAINTS. Office and Works,
28 TO 32 RIVER STREET,
CLEVELAND, O.

Send for circulars and price list, naming the CAR-BUILDER.

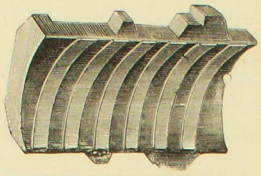
The prices of Worthington Steam Pumps and Boilers combined, for Railway Tank service, have been reduced. The combination embodies some improvements that have been made subject of letters patent, and the above reduction is made in order to insure its speedy adoption. The pumps are used on nearly all of the principal Railroads in this country and Canada. Send for Circular and reduced Price-list.

HENRY R. WORTHINGTON.

NEW YORK, 239 Broadway. BOSTON, 70 Kilby St. ST. LOUIS, 707 Market St.

The Leroy Journal Bearing Co.,

145 BROADWAY, NEW YORK CITY,



Has the **SOLE RIGHT** to manufacture and sell **JOURNAL BEARING BRASSES** under Letters Patent issued to T. V. Leroy, Nov. 18, 1879, and reissued Feb. 17, 1880, Aug. 16, 1881. Testimonials, which may be seen at the office of the Company, show our brasses to be the Best and Most Economical in use. We claim that their use saves one-third in oil, and two sets will outwear three of any other brasses. Those interested in Railroads will do well to examine. Address

GEO. W. McLEAN,
President.

ANNUAL SALES 3,000,000 BOTTLES!

CARTER'S INKS

CARTER, DINSMORE & CO., BOSTON AND NEW YORK.

IRON CLAD PAINT.

Trade-Mark Patented.

This Paint is used by nearly all the Railroads in the Country.

Used by L. S. & M. S., Wabash R'y, C., C., C. & I. R'y, C. & P. R'y, C., H. & D. R. R., Cincinnati Southern R'y, N. Y., L. E. & W. R'y, (Erie), Southern Central R. R., Canada Southern, Mobile & Ohio, N. O. & Mobile, Macon & Brunswick, Penn. R. R. C., M. & St. P. R'y, A. & N. R'y, R. & D. R'y, Carolina Central, P., C. & St. L. R'y, P. & E. R. R., M., L., S. & W. R'y, K. & D. M. R'y, W. C. & A. R. R., M. L. & N. R'y, N. C. & St. L., N. L. & E. R. R., L. & G. N. R. R., etc., etc.

IRON CLAD PAINT CO., Cleveland, Ohio.

72 lbs Metal as the 100 lbs ADULTERATED FIRE PROOF 300 lbs. METALLIC PAINT

Established 1858.

THE
Prince Manufacturing
COMPANY,
SOLE MANUFACTURERS OF

Prince's Metallic Paint.

The best Paint in the World for Iron, Tin and Wood.

Send for a Circular to

71 Maiden Lane, N. Y.

RAILROAD AND MACHINISTS' **SUPPLIES.**

SOLE MANUFACTURERS OF

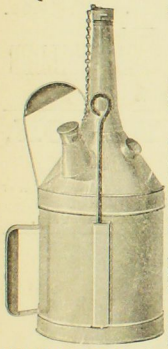
EUREKA
Post Hole Digger.

REDUCED PRICE, $3.

LIBERAL DISCOUNT TO THE TRADE. A valuable tool for nurserymen and well-diggers. Send for circular.

CAMPBELL & LILL,
228 Lake St., Chicago, Ill.

NOYES' PATENT
LIQUID COOLER & COMPOUND LUBRICATOR,



For Cooling Railroad Car and Steamboat Journals and Bearings of all Kinds, and for Mixing with Other Oils.

The attention of those who are running heavy journals is respectfully invited to the above Liquid Cooler. It has been successfully used for upward of ten years and is consistently growing in favor as its merits become known, and we are confident that practical men cannot fail of being convinced that our preparation deserves their candid attention. What we claim for it is:

That it will Cool a Hot Journal When in Motion

and extinguish the flame when the box is on fire; that its use will, in a great measure, prevent the occurrence of a hot journal, and save the expense, delays and annoyances incident thereto; that it will eliminate the heat from a journal at a temperature greatly below the point required to melt the babbitt, preventing the accumulation of heat, and by a timely application save it from destruction; that its non-inflammable elements (where waste is used) permeate the waste and prevent its taking fire; that it keeps the journal smooth and polished, preventing unnecessary friction; that its combination is based upon true scientific principles, which renders it impossible to fail in its results, and is the

Only Preparation that will Cool a Hot Journal

while it is in motion, as attestedly certificates below; that one thorough application on a hot journal will do more execution in cooling than the constant application of water for half an hour, besides doing it evenly and without loss of time.

Every Railroad Train or Steamboat

should have a can of the Liquid Packing on board, with the directions for its use pasted upon it, and thus have always at hand the means of effectually cooling a hot journal, and thereby avoid the expense, danger and trouble from this cause.

WHAT RAILROAD MEN SAY OF IT.

SALEM, Aug. 7, 1872.

MR. P. NOYES.—*Dear Sir:* I have been using your Liquid Packing for cooling car journals for some time past, and have been well pleased with it. I have had occasion to use it a number of times, under Pullman Cars, and it has been a complete remedy in every case of hot journals.

Every train should be provided with it, as it is a saving of time and expense in the running of trains, provided it is applied and cared for according to directions for using.

Yours truly,
J. P. SOMERBY,
M. C. B. Eastern Railroad.

SALEM, Aug. 28, 1880.

I can recommend Noyes' Liquid Cooler as an excellent article to carry on trains for use in case of Hot Journals, which it cools, without injury to the journals, more effectually than anything I know of.

J. D. BILLINGS,
M. C. B. Eastern Railroad.

Our Liquid Cooler is now in use, and has been from one to eight years, upon the following roads, and we have numerous recommendations from them: Boston & Maine R. R., Boston & Lowell R. R., Intercolonial R. R., Boston, Concord & Montreal R. R., Fitchburg R. R., Eastern R. R., New York, New Haven & Hartford R. R., New York & New England R. R., Connecticut River R. R., Delaware & Hudson Canal Co., Old Colony.

BOSTON, April 7, 1880.

P. NOYES, Agent.—*Dear Sir:* Please send for account of Eastern Railroad five barrels Liquid Cooler.

GEO. J. FISHER, P. A.

BOSTON, MAY 24, 1877.

P. NOYES, Agent.—*Dear Sir:* Having used your Liquid Cooler two or three years, I find it necessary for the safe running of our cars to continue its use. When the Coolor is mixed with black oil, according to directions, the compound is equal to lard or sperm oil, and it is the best Cooler I have ever used.

Yours truly, JOHN F. CROCKETT,
Master Mechanic Boston, Lowell & Nashua R. R.

BOSTON, April 23, 1880.

BELT AND LEATHER STUFFING CO.—*Gents:* Please send to East Cambridge, for account Boston & Lowell Railroad, five barrels Liquid Cooler.

Yours truly, F. H. NOURSE,
Purchasing Agent.

SEND FOR A BARREL. NO CHARGE UNLESS IT DOES ALL WE STATE.

MANUFACTURED BY THE

NOYES MANUFACTURING CO., P. Noyes, General Manager,

47 INDIA STREET, BOSTON.

AMERICAN BARB FENCE WIRE.

PAINTED, JAPANNED OR GALVANIZED.

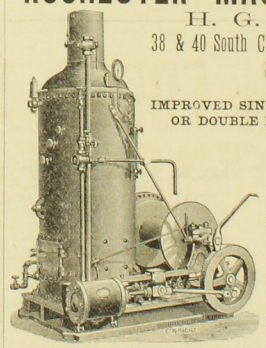
This Wire contains six times as many Barbs per foot as any other, and is the only Fence that is as efficient against small as against large animals. It will not slip through the Staple, and is the only Barb Wire that is **Galvanized after it is Finished,** which adds greatly to its strength and durability. This Wire is made on an entirely different principle from any other, is amply secured by Letters Patent and no infringement upon any other Patent Right.

AMERICAN FENCING CO.,

Works: Nos. 232, 234, 236, 238 West 29th Street. Nos. 229, 231, 233, 235, 237, 239 West 28th Street. Office: 234 West 29th Street, New York.

ROCHESTER MACHINERY MF'G CO.

H. G. WORMER & CO.,
38 & 40 South Canal St., Chicago, Ill., Branch 807 North Second St., St. Louis, Mo.



IMPROVED SINGLE OR DOUBLE CYLINDERS—SINGLE OR DOUBLE FRICTION DRUMS OR REVERSIBLE LINK MOTION

HOISTING ENGINES,

And specially adapted to Pile-Driving, Pumping, Hoisting Timber, Brick, Mortar, Stone, Coal, Slate, Ores, Iron, Cargo Ballast. Also for Steamers, Ships, Lighters, Barges, Docks, Warehouses, Stevedores, Contractors, Railroads, Mines, Quarries, Etc., Etc.

Send for special catalogues.

We make 180 different sizes and kinds.

IMPROVED PORTABLE AND STATIONARY ENGINES—PORTABLE, STATIONARY AND VERTICAL BOILERS, SAW MILLS AND MACHINERY.

On application will be pleased to send you catalogue of what you may want in the shape of machinery.

☞ Say where you saw this. ☜

IRON RAILS,
STEEL RAILS,
FISH-PLATES,
TRACK BOLTS,
MERCHANT BAR,
CAR IRONS A SPECIALTY.

SPRINGFIELD IRON CO.,

SPRINGFIELD, ILL.,

NEW YORK OFFICE: 30 Pine St., JAS. JOHNSTON, Agt.

CHICAGO OFFICE: 111 Dearborn St., C. V. HICKOX, Agt.

Hopkins' Patent Lead-Lined, Self-Fitting Journal Bearings,

AND

Meneely's Patent Bell-Metal Ended Journal Bearings, for Reducing Lateral Wear.

MADE BY

GEO. R. MENEELY & CO., West Troy, N. Y.,
and Atlanta Brass Foundry (A. B. Bostick, Supt.), Atlanta, Ga.

Bound Volumes of the National Car-Builder

For 1880 and 1881.

Price, - - - $3.00 each.

GEO. W. READ & CO.,

IMPORTERS AND MANUFACTURERS OF

MAHOGANY

AND ALL FOREIGN AND DOMESTIC

CABINET WOODS.

QUALITY AND SIZES SPECIALLY DESIGNED FOR

CAR BUILDING.

Mills and Warerooms:

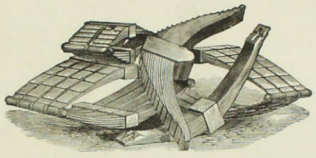
186 to 200 Lewis Street, foot Fifth and Sixth Streets, E. R., New York.

CALVIN WELLS. PITTSBURGH AARON FRENCH.

CAST-STEEL SPRING WORKS

A. FRENCH & CO.,

MANUFACTURERS OF

EXTRA TEMPERED,  LIGHT ELLIPTIC

CAST-STEEL SPRINGS,

WITH PATENT HOT COMPRESSED BANDS FOR RAILROAD CARS AND LOCOMOTIVES.

UNITED STATES CENTENNIAL COMMISSION, OFFICIAL REPORT.—Diploma and Medal awarded for Good Design, Excellence of Workmanship and Material, Uniformity of Action and Durability.

OFFICE AND WORKS: Corner of Liberty and Twenty-first Streets, PITTSBURGH, PA.

H. A. LITTLE, Room 91, Boreel Building, New York; GEORGE DUNBAR & Co., 109 Milk Street, Boston;
GEORGE W. MORRIS, Room 5, Ashland Block, Chicago; M. M. BUCK & CO., 209 North Third Street, St. Louis, Mo., Agents.

CALVIN WELLS, President and Treasurer. JAS. K. VERNER, Secretary.

PITTSBURGH FORGE AND IRON COMPANY,

Office: TENTH ST., near PENN AVE.,

PITTSBURGH, PA.,

MANUFACTURERS OF HAMMERED

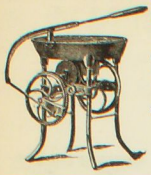
CAR AND LOCOMOTIVE AXLES

We make a Specialty of our well-known brand of Railway Axles marked "Special" from new iron, guaranteed to be purely fibrous, and to stand the regulation drop test of the Penna. R. R. Company.

ALSO,

BAR IRON & BOLTS,

Channel and Angle Iron, Bridge Bolts, plain and upset ends, all sizes, Track Bolts, Square and Hexagon Head Bolts, Rivets, Washers, Fish Plates, Etc.



Portable Forges and Hand Blowers.

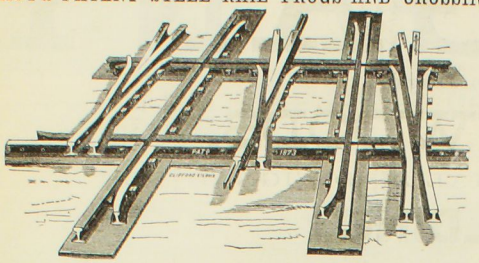
THE EMPIRE, WITHOUT BELTS. DEAD CENTER OR BACK MOTION.

THE WESTERN WITH BELTS AND LEVER HANDLE. CHEAPEST MADE.

SEND FOR CIRCULAR TO

EMPIRE PORTABLE FORGE CO., COHOES, N. Y.

ELLIOT'S PATENT STEEL RAIL FROGS AND CROSSINGS.



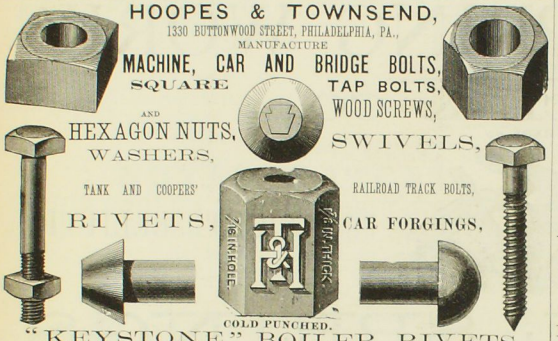
These Frogs and Crossings are made of steel rail, combined with a wrought-iron frame, and bound together transversely with strong bolts, which gives them great strength and durability without destroying their elasticity. They are connected at all ends by Fish-Plate Joints, and lie on the same tie surface as the running rail without any cutting of ties, thus saving a great deal of time and labor in putting in place on track.

Manufactured by H. & H. ELLIOT, East St. Louis, Ill.

HOOPES & TOWNSEND,

1330 BUTTONWOOD STREET, PHILADELPHIA, PA., MANUFACTURE

MACHINE, CAR AND BRIDGE BOLTS, SQUARE AND HEXAGON NUTS, TAP BOLTS, WOOD SCREWS, WASHERS, SWIVELS, TANK AND COOPERS' RIVETS, RAILROAD TRACK BOLTS, CAR FORGINGS,



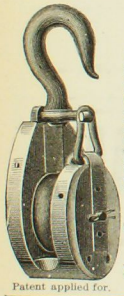
COLD PUNCHED.

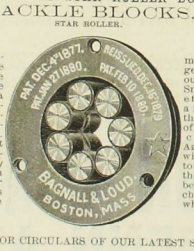
"KEYSTONE" BOILER RIVETS.

IMPROVED SNATCH BLOCK.

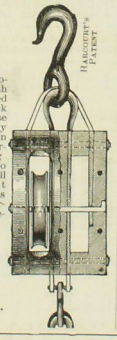
METALINE AND STAR ROLLER BUSHED TACKLE BLOCKS.

STAR ROLLER.





These celebrated make of Tackle Blocks are making a wide reputation for themselves throughout the U. S. on account of their *greater durability* and ease in hoisting over all kinds now in the market. Together with our Improved Snatch Block etc., these are worthy the attention of all Purchasing Agents, who will do well to inspect these goods before purchasing elsewhere.



SEND FOR CIRCULARS OF OUR LATEST STYLES.

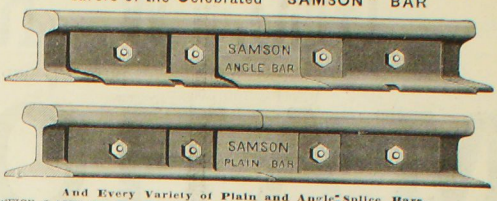
NEW YORK AGENCY, 33 SOUTH STREET.

BAGNALL & LOUD, 139 Fulton Street, Boston.

Patent applied for.

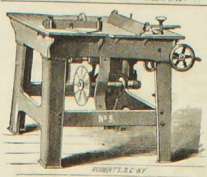
CHICAGO SPLICE BAR MILL.

MORRIS SELLERS & CO., Sole Proprietors and Manufacturers of the Celebrated "SAMSON" BAR



And Every Variety of Plain and Angle Splice Bars.

OFFICE, 6 ASHLAND BLOCK ..... Mill, Chicago Ave. and the River..... CHICAGO.



ROLLSTONE MACHINE CO.

Wardwell Saw Benches a specialty.

These machines are in use in the car shops of the Penn. R. R., B. & O., P. W. & B. & A. F. R., Mich. Central, and some fifty other of the largest shops in the country

Also, A HEAVY BAND SAW FOR CAR WORK.

ROTARY, STATIONARY, BED & BUZZ PLANERS,

And a large number of other machines for car work.

We are dealers in all kinds of Second-Hand Machinery, Engines, Boilers, Iron and Wood-Working Machinery.

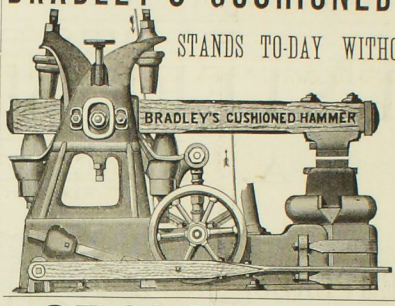
No. 3 Wardwell Saw Bench.

Do not buy until you send for new descriptive list, stating just what you want, inclosing stamp.

ROLLSTONE MACHINE CO., 131 WATER ST., FITCHBURG, MASS.

BRADLEY'S CUSHIONED HAMMER

STANDS TO-DAY WITHOUT AN EQUAL.



It approaches nearer the action of the Smith's arm than any hammer in the world.

BRADLEY & CO.,

Syracuse, N. Y.

[Established 1832.]

GROUND TRIPOLI,

THE BEST THING KNOWN FOR CLEANING AND POLISHING THE

METAL WORK on LOCOMOTIVES and CARS.

That manufactured by us is warranted not to scratch, and has been used for several years by the principal Railroad Companies and by Fire Departments generally, and is highly recommended by them. Send for sample.

GEORGIA MINING & MANUFACTURING CO.,

MINES AND MILL, DALTON, Ga. 63 BROADWAY (Room 40), NEW YORK.

Established 1818.

NEW ENGLAND GLASS WORKS.

W. L. LIBBEY & SON,

67 Federal St., Boston, Mass.

MANUFACTURERS OF THE

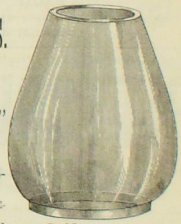
"N. E. Standard Railway Colors,"

RUBY, GREEN & BLUE,

FOR

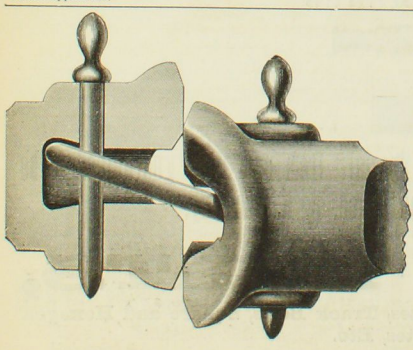
LANTERN GLOBES, CORRUGATED & BULL'S-EYE SWITCH LIGHT LENSES.

RAILWAY SUPPLIES IN GLASS, OF EVERY DESCRIPTION.



Head Light and Car Lamp Chimneys, Bell-rope Guides.

SEND FOR PRICES.



SAFFORD'S SAFETY DRAW-BAR.

"VICTORY OVER MORE THAN 30 CONTESTANTS."

Victory over more than 30 Self-Couplers in the Master Car-Builders' convention of June, 1876. Also indorsement for safety in coupling by the Yard Masters, in their Convention, June, 1877, and by 300 others who were unable to attend the Convention, and 300 railroad officials who are resident in 26 States, and who admitted superiority over any other yet produced. Try 30 free of royalty, and see for yourself! Pattern free, and no change in timbers or connections. Those made by Wilson, Walker & Co., Pittsburgh, Pa., *will save 200 per cent. in repairs*, and give double life service over *old styles of* wrought iron. About 43,000 in use by 146 railroads. The *saving in repairs* by using *my invention* is from 20 per cent. to 80 per cent. as per *report of many officers.*

J. B. SAFFORD,

EAGLE IRON WORKS,

BUFFALO, N. Y.

NATIONAL RAILWAY PATENT WASTE COMPANY.

The most economical, efficient and desirable material for packing JOURNAL BOXES of CARS is Cotton Seed Hulls.

The company proposes to license railroads to use this valuable article for packing, on very liberal terms. Send for circular to

R. W. GUERNSEY, President, 240 Broadway, New York.

VENEERS. 24 SAMPLES FINE WOODS, NINE CENTS.

Any one who works in wood will find these Prepared Veneers not only cheap, but beautiful and durable and easily applied. In use by Furniture Manufacturers, Piano and Organ Builders, Car Contractors, and for elegant finish in private residences. Follow directions, success sure. Send for descriptive circular and samples. 24 samples by mail 9 cents.

CHAS. W. SPURR,

209 Canal St., N.Y., and 522 Harrison Ave., Boston.

LOWE'S METALLIC PAINT COMPANY,

CHATTANOOGA, TENNESSEE.

We are using it on all the freight equipment on the line. R. WELLS, Supt. Machinery, L. & N. R. R.

We are especially pleased with it and shall continue the use of it. G. C. BREED, Asst. Gen. Manager, L. & N. R. R.

Our foreman painter reports of your paint to be the best he has ever used. G. R. CARR, Gen. Supt. C., H. V. & T. R. R.

It has given us entire satisfaction, and we are now using it exclusively on cars and similar work. R. F. FIELDS, Master Painter. J. G. SAWYER, Master Car-Builder. N. C. & St. Louis R. R.

I shall use it on all my turbine wheels, as I think it superior to any other. J. T. WILDER.

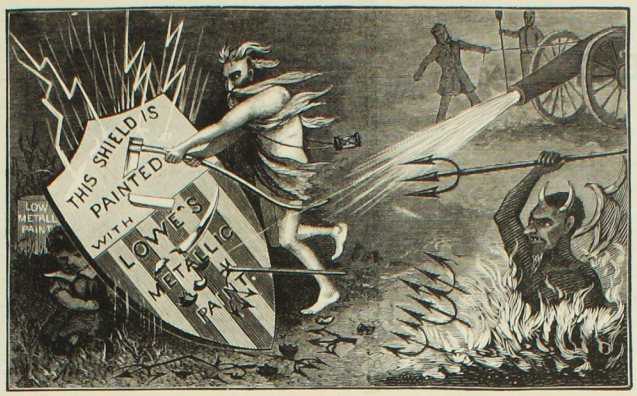
We have adopted its use permanently for painting our engines, as we think it superior to any other. ERIE CITY IRON WORKS, Erie, Pa.

We find it of very superior quality and shall use it on all of our railroad bridges and other iron work. WILKINS, POST & CO., Atlanta, Ga.

In grinding we find it takes from **ten to twenty-five per cent. less oil than various other brands of oxide of iron we have heretofore handled.** PEASLEY, GAULBERT & CO., Louisville, Ky.

We have found it perfectly satisfactory and equal to any we have ever used. JOHN F. O'BRIEN, Gen. Supt. E. T., Va. & Ga. R. R.

It is the best Mineral Paint we have used. T. & H. SMITH & CO., Manufacturers of Wagons and Carriages, Pekin, Ill.



(TRADE MARK.

Your Paint has given us entire satisfaction. DETROIT DRY DOCK CO.

We consider it superior to any Mineral Paint we have ever used or seen. LIVERMORE FOUNDRY & MCH. CO., Memphis.

It is the best as well as the cheapest Paint we have ever used. CLEVELAND WROUGHT IRON FENCE WORKS, Cleveland, O.

We think it superior to any in the market, and shall soon want another car load. MILBURN WAGON CO., Toledo, O.

We prefer it to any of the various other kinds of Metallic Paint we have ever used. Please send us another car load at once. T. C. SNYDER & CO., Manufacturers of Sheet Iron Roofing, Canton, O.

We find your Paint of first-class quality and very economical. KING BRIDGE CO., Cleveland, O.

Your Paint gives us entire satisfaction. DULUTH & DUBUQUE BRIDGE CO., Dubuque, Ia.

We like your Metallic Paint and shall continue to use it on our Sheet-Iron Roofing. SCOTT & CO., Manufacturers Sheet-Iron Roofing, Cincinnati, O.

It gives us entire satisfaction, and we regard it as the best Iron Paint we have ever used. W. G. HYNDMAN & CO., Manufacturers Sheet-Iron Roofing, Cincinnati, O.

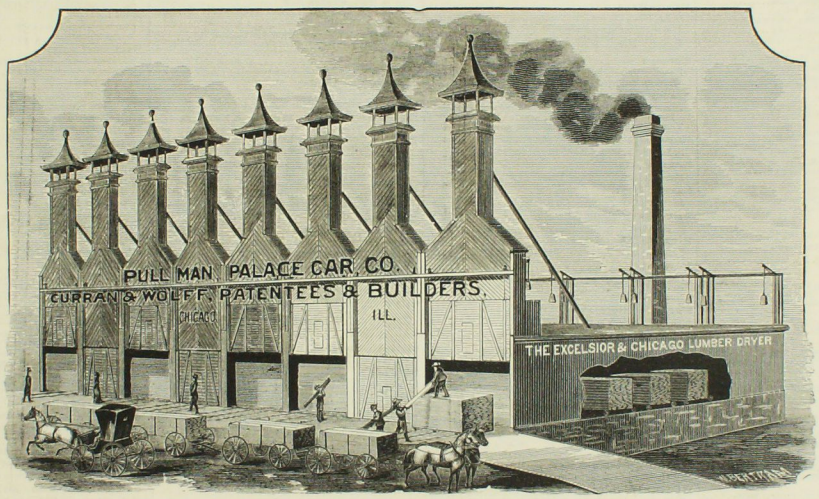
I consider it the best Paint I have ever seen for all kinds of iron work, and is especially adapted for engines, boilers, and, in fact, any kind of machinery. J. W. BURK, New Orleans.

Our Paint is manufactured in a very superior manner, and is warranted to contain not less than 55 per cent. of Metallic Iron. It takes much less oil than any other Metallic Paint, for which see certificates above. It is now being used on the following lines of railways: Western & Atlantic R. R.; Vicksburg & Meridian R. R.; Rochester & Pittsburgh R. R.; Richmond & Petersburg; Richmond, York River & C. R. R.; Paducah & Elizabethtown R. R.; N. Y., T. & Mexican R. R.; N. O. & St. Louis R. R.; Macon & Brunswick R. R.; Memphis & Charleston R. R.; M. & O. R. R.; Miss. & Tenn. R. R.; L., N. & Great So. R. R.; L., P. & C. R. R.; Gulf, Col. & Santa Fe R. R.; E. T., V. & Ga. R. R.; Central R. R. & Banking Co.; C. & H. V. R. R.; H. & D. R. R.; C., C., C. & I. R. R.; Ala. G. S. R. R.; S., R. & D. R. R.; Ala. Central, and many others, who purchase of parties to whom we sell. We are supplying nine Car and seven Wagon Factories regularly. The above certificates express what our customers think of it. Special rates of freight to all points in the United States and Canadas.

THE EXCELSIOR AND CHICAGO LUMBER DRYER is Built under 16 Patents.

PAYS FOR ITSELF EVERY YEAR.

Storing Capacity, 40,000 feet Inch Lumber.



DRYING 1,000 FEET PINE LUMBER IN 24 HOURS.

RAILROAD COMPANIES AND CAR-BUILDERS WHO ARE USING THE EXCELSIOR AND CHICAGO LUMBER DRYER.

	No. of Dryers.
Pullman Palace Car Company, Chicago	8
Wells & French Co., Chicago	3
C. & N. W. Railroad, Chicago	3
Flint & Pere Marquette R. R., Saginaw	1
Peninsular Car Works, Detroit	1
Michigan Car Company, Detroit	2

	No. of Dryers.
Memphis & Charleston Railroad, Memphis	1
Ohio Falls Car Company, Jeffersonville, Ind.	2
Denver & Rio Grande Railway, Denver, Col	2
U. S. Rolling Stock Co., Chicago	1
Chicago, Burlington & Quincy R. R., Aurora, Ill.	
Southern Car Works, Knoxville, Tenn	

	No. of Dryers
Atchison, T. & S. Fe Railway, Topeka, Kan	1
Barney & Smith Company, Dayton, O.	4
Missouri Car & Foundry Co., St. Louis	1
Jackson & Sharp Co., Wilmington, Del.	
The Harlan & Hollinsworth Co., Wilmington, Del.	
Billmeyer & Small Co., York, Pa.	

CURRAN & WOLFF, Proprietors and Builders, 39 and 41 FRANKLIN STREET, CHICAGO, ILL.

AJAX METALS,

Especially Adapted for LOCOMOTIVE, CAR, ROLL-NECK and MACHINERY BEARINGS, and for Pump-Rods, Valves, Plungers, etc., for Mine Use where sulphurous water and acids are found.

LETTERS PATENT have not been taken out, so that any one using our goods runs no risk of being associated with any lawsuit. **NO INTERFERENCE** can be filed against the use of Ajax Metal; on the contrary, letters of recommendation from the leading steel and iron mills, foundries and machine shops of this country are shown upon application. Also reports of tests as made by MASTER CAR-BUILDERS and MASTER MECHANICS, who are acknowledged AUTHORITY. Full information given on application to

GEO. B. CUSHING, 224 Front St., New York; THOMPSON, EPPING & CARPENTER, Pittsburgh; N. F. THOMPSON, Savannah, Ga. POST & CO., Cincinnati; M. M. BUCK & CO., St. Louis.

THE ELKINS MANUFACTURING AND GAS CO., 617 and 619 Arch Street, Philadelphia, Sole Manufacturers of AJAX METALS.

HOOKS BRONZE AND COMPOSITION CAR AND LOCOMOTIVE BEARINGS.

HOOKS SMELTING CO.

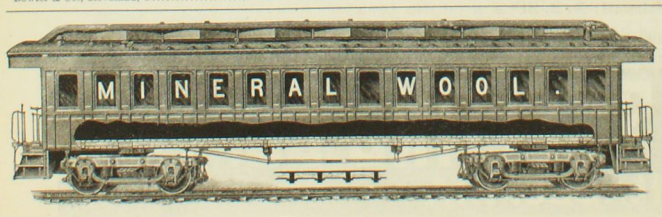
PHILADELPHIA

MANUFACTURERS AND DEALERS IN RAILWAY SUPPLIES.

INDEX TO ADVERTISEMENTS

IN THE

National Car-Builder.



As a filling for floors of passenger cars, this material prevents the loss of heat, deadens the sound and lowers the center of gravity of the car. More effective than shavings of double the thickness and entirely fireproof. Valuable also for covering all heated surfaces. Only $6 per 100 sq. feet, filling 3 inches thick. Sample and circular free by mail.

U. S. Mineral Wool Co.,

16 CORTLANDT ST., NEW YORK.

JOHN T. LEWIS & BROS. WARRANTED PURE WHITE LEAD. PHILADA. TRADE MARK.

Manufacturers of White Lead, Red Lead, Litharge, Orange Mineral, Linseed Oil and Painters' Colors.

No. 231 South Front Street.

Important to Railroad Managers and Master Mechanics.

SIBLEY'S PERFECTION VALVE OIL.

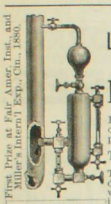
More perfect lubrication insured, and entire freedom guaranteed from corrosion of cylinders and destruction of steam joints by fatty acids.

In exclusive use on 50 railroads.

References and prices furnished upon application.

☞ Make exclusive specialty of the Manufacture of Valve and Signal Oils for Railroad use.

SIGNAL OIL WORKS,
FRANKLIN, PA.
J. C. SIBLEY, President.



First Prize at Fair Amer. Inst., and Inter'l Exp., Chi., 1866.

THE DETROIT
Lubricator Mfg. Co.'s
CONTINUOUS FEED
LUBRICATOR CUPS

For oiling valves and cylinders of steam engines, by the only perfect method,

Through the Steam Pipe.

The oil passes *in sight*, drop by drop, into the column of steam, where it vaporizes, thus becoming a *steam lubricant*, oiling perfectly every part reached by the steam. Any *clean oil*, black or white, light or heavy, may be used. Saves from 50 to 90 per cent. in oil and wear of machinery, thus paying for itself several times a year. A cup will be sent to responsible parties on 30 days' trial if desired. In ordering give diameter of cylinder. Address

NOTICE.

The first Lubricators ever made, showing the oil by passing drop by drop thro' a transparent water chamber were devised by us, and the same are fully embraced by many Letters Patent owned and controlled by us. Lubricators of every nature embodying the above feature, made by other parties, are encroachments upon our rights, and we will hold purchasers and users, as well as manufacturers, responsible in damages for such violations.

DETROIT
LUBRICATOR MFG. CO.
Office, 89 Griswold St.,
DETROIT, MICH.

NOTE.—In our recent suit against the American Lubricator Co., of Detroit, before Justice Stanley Matthews, of the U. S. Supreme Court, involving their "sight feed" feature, a decree was rendered in our favor Aug. 20, 1881.

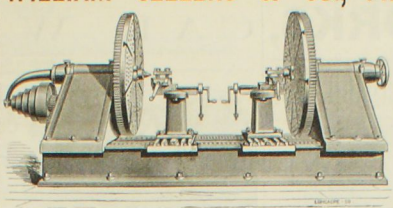
Please mention this paper.

THE STANDARD LUBRICATING OIL OF AMERICA
FOR RAILROADS.
GALENA
ENGINE, COACH AND CAR OIL.
Gravity, 26°, 27°, 28°, 29°. Cold Test, 10° to 15° below zero.

No freezing in coldest weather, and entire freedom from hot journals at any time, as its exclusive use upon a majority of the leading railroads has demonstrated.

Showing Better Results than any Oil Extant.
REFERENCES FURNISHED ON APPLICATION.
GALENA OIL WORKS (Limited),
FRANKLIN, PA.

WILLIAM SELLERS & CO., PHILADELPHIA,



Iron and Steel Working Machine Tools, for Railways, Machine Shops, Rolling Mills, etc.
TURN-TABLES, PIVOT BRIDGES, SHAFTING.

BRANCH OFFICE, 79 LIBERTY STREET, NEW YORK.

228 Hudson Street, New York. THE 346 Euclid Avenue, Cleveland, O.

MICA MANUFACTURING CO.,
SOLE MAKERS OF THE FAVORITE
Improved Mica Car Grease
AND ALL GRADES OF CAR, AXLE AND ROLLING-MILL GREASES

☞ Correspondence invited and sample barrels cheerfully furnished for trial.

31 Michigan Avenue, Chicago, Ill. 508 Delaware Street, Kansas City, Mo.

Denison's Cooling Lubricating Compound,
FOR COOLING AND LUBRICATING HOT JOURNALS.

DIRECTIONS.—For cars or engines, pack the box so that the Compound will come in contact with the bearing and journal, using waste saturated with oil; also moisten the Compound with oil. For shafting and places where waste can not be used, mix the Compound with oil, and apply to the bearing. If the bearing be very hot, the first application may run off, but two or three applications will cool it. When a journal is hot, don't cool it with water, but apply the Compound; **and no matter how hot it is, it will cool it while in motion.** When you apply new bearings, fill them with the Compound before putting them on the axle, and pack the sides of the box next to the bearing with the Compound, and your boxes will run cool. **For Sale by**

ALLEN MIDDLETON, 945 Ridge Ave. Phila. C. A. SMITH 113 Liberty St., N.Y.

PURE TURKISH EMERY.

Quartz, Pumice and Rotten Stone, Crocus, Rouge, Glue, Sand Paper, Emery Paper and Cloth, Emery Wheels, &c., &c., &c.

WALPOLE EMERY MILLS,
MILLS, South Walpole. OFFICE AND STORE, 114 MILK STREET, BOSTON.
Purchasing Agents furnished with sample cases upon application

PERFECT LUBRICATOR. SAMUEL MORGAN, President. NO HOT JOURNALS. GEO. G. GORDON, Vice-President. C. C. DUNN, JR., Treasurer. OVER FIFTY PER CENT. SAVING GEO. C. MITCHELL, Secretary.

THE AMERICAN LUBRICATING CO.,
Manufacturers of CAR AXLE LUBRICATORS,
No. 407 NORTH THIRD STREET, PHILADELPHIA.

Spiral Spring four and a half inches high, four inches in diameter, fastened to a malleable iron top, containing a roller with bristles transversely inserted, the sides of the spring covered with felt and having one of the lips formed of the same material; when in position the outer edges of the concave roller are pressed against the surface of axles, the motion of which causes the roller and bristles to revolve and to distribute the oil in proportion to the velocity of the axles while the sides of feet saturated with oil act as "wipers" and lubricators; and the end lip performs similar duties, preventing waste of oil and the entrance of grit and dust.

FELTON, RAU & SIBLEY,
136, 138 & 140 North 4th St., Philadelphia, Pa.,
MANUFACTURERS OF
FINE RAILWAY VARNISHES AND PAINTS
Smoke-Stack Black, and Colors Prepared for Passenger and Freight Cars, Specialties.

Thayer, Dunham & Ross,
50 BROAD STREET, BOSTON,
MANUFACTURERS' AGENTS
RAILROAD SUPPLIES.
NEW ENGLAND AGENTS
AJAX METALS, FOR RAILROAD JOURNAL BEARINGS.
A SPECIALTY.
RAILROAD
OILS

EAGLE CAR-BOX LUBRICATOR COMPANY.
NO MORE HOT BOXES!

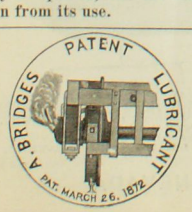
We can give the highest of references, including some of the best roads in the United States. We claim that our compound is a perfect cooler; saves brasses, and trouble and annoyance of frequent greasing. This is abundantly proved by our continual orders from railway companies, who are deriving the greatest satisfaction from its use.

TRADE MARK.

We sell in quantities of from five barrels to car loads and no charge is made unless it proves satisfactory.

We also manufacture the EAGLE MACHINERY AND CUP COMPOUND, which takes the place of Sperm and Lard Oil. It has been tested in Navy Yards and Engine and Machine Shops. Pamphlets explain further.

Address A. G. MANDEL, General Manager, P. O. Box 2555; Office, 26 Burling Slip, New York.



HOT JOURNALS ENTIRELY PREVENTED.
BRIDGES' LUBRICANT
FOR RAILROAD CAR JOURNALS AND OTHER BEARINGS.
SAMPLES FURNISHED GRATIS. SEND FOR CIRCULAR.
Manufacture Ball's Telescopic Screw Jack.
JOHN S. URQUHART, Successor to
ALBERT BRIDGES, 46 CORTLANDT STREET, NEW YORK.

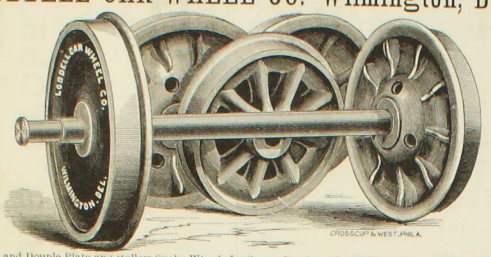
ESTABLISHED 1847.

A. WHITNEY & SONS'

CAR WHEEL WORKS,

PHILADELPHIA.

LOBDELL CAR WHEEL CO. Wilmington, Del.

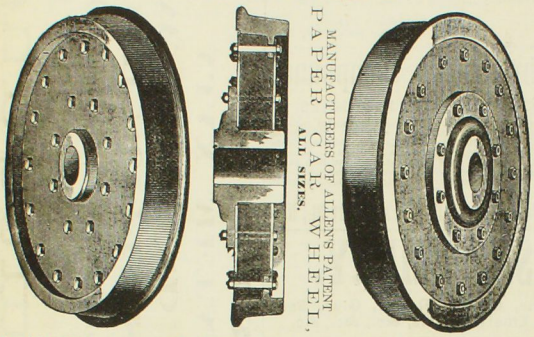


Single and Double Plate and Hollow Spoke Wheels for Steam Roads. Also, Solid and Open Plate Wheels for Street Roads. Wheels with Turned Threads, under the Patent of "W. W. Lobdell."

GEO. G. LOBDELL, President. W. W. LOBDELL, Secretary. P. N. BRENNAN, Treasurer.

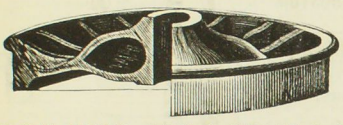
ALLEN PAPER CAR WHEEL COMPANY.

General Offices: 240 Broadway, N. Y.



Especially adapted for Sleeping and Drawing-Room Cars, Locomotive and Tender Trucks. Steel Tire with Annular Web—Strongest, Most Durable, and Most Economical Wheel in use. Works at Hudson, N. Y; and at Pullman, near Chicago, Ill.

A. G. DARWIN, President. J. C. BEACH, Treasurer. C. H. ANTES, Secretary.



WASON

MANUFACTURING CO.,

SPRINGFIELD, MASS.

BUILDERS OF

RAILWAY CARS OF ALL DESCRIPTIONS,

CAR WHEELS AND RAILWAY CASTINGS.

H. S. HYDE, Treasurer. G. C. FISK, President.

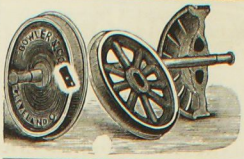
DAVENPORT, FAIRBAIRN & CO.,

ERIE, PA.

MANUFACTURERS OF

CAR WHEELS.

Capacity 350 Wheels per day. Wheels made by improved process. Far more durable than those made in the ordinary way.



CLEVELAND FOUNDRY.

Car Wheels of All Kinds and Sizes

WITH OR WITHOUT AXLES.

CHILLED-FACED RAILROAD FROGS

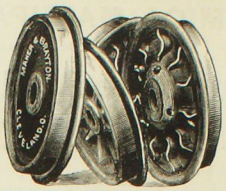
Street Railroad Turnouts.

ROLLING MILL AND MACHINERY CASTINGS

Nos. 9, 11 and 13 Winter St., Cleveland, O.

BOWLER & CO.

CLEVELAND WHEEL AND FOUNDRY WORKS,



MAHER & BRAYTON, Proprietors.

MANUFACTURERS OF

CAR, ENGINE, TRUCK AND TENDER WHEELS RAILROAD, ROLLING-MILL AND MACHINERY CASTINGS, AND STREET RAILROAD WHEELS AND TURNOUTS.

ALSO,

CHILLED-FACED RAILROAD FROGS.

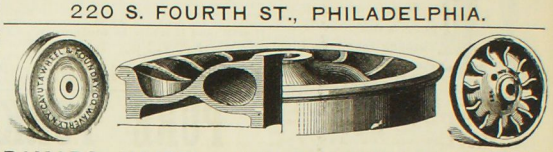
Office: 20 Carter Street.

Works: Cor. Carter and Collins Streets, Cleveland, O.

THE STANDARD STEEL WORKS.

LOCOMOTIVE & CAR WHEEL **TIRES.**

220 S. FOURTH ST., PHILADELPHIA.



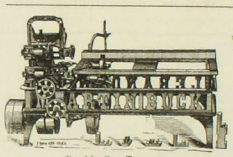
RAMAPO WHEEL AND FOUNDRY COMPANY,

MANUFACTURERS OF

Chilled Wheels for Drawing-Room and Sleeping Coaches, Locomotives, Tenders, Passenger and Freight Cars.

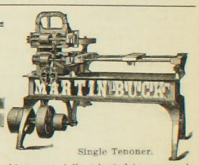
GEO. CHURCH, President and Treasurer. W. W. SNOW, Superintendent and General Manager

RAMAPO, ROCKLAND COUNTY, N. Y.



Double Car Tenoner.

Blind Mortiser.



Single Tenoner.

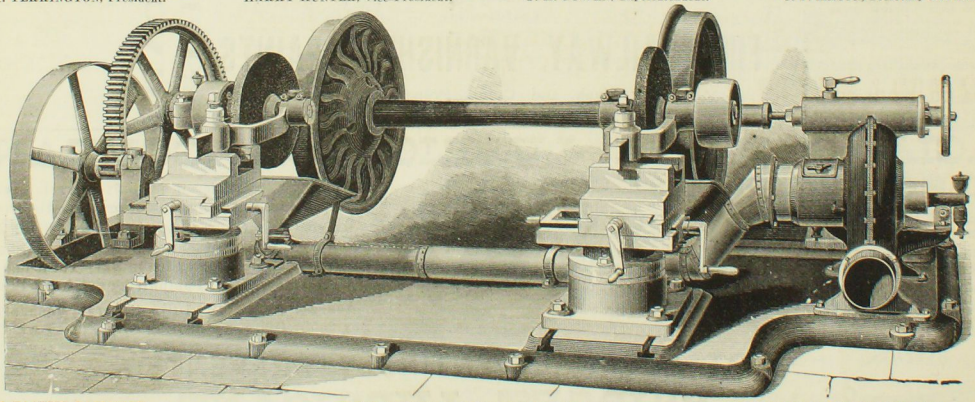
Single, Double and Triple Tenons and Gaining done on the same machine; especially adapted to car work. Single Tenoners all iron, with carriage mounted on trucks; Blind Mortiser and Borer combined for fixed and rolling slats; Adjustable Groover Heads, and a full line of Wood-working Machinery.

MARTIN BUCK, Lebanon, N. H.

CHILLED CAR WHEEL GRINDING COMPANY.

Patented in United States and Canada.

H. M. YERRINGTON, President. HARRY HUNTER, Vice-President. J. H. GOWEN, Superintendent. C. P. MASON, Secretary and Treasurer.



CENTRAL PACIFIC RAILROAD,
CHICAGO & NORTH-WESTERN RAILWAY,
CHICAGO, ROCK ISLAND & PACIFIC R'WAY,
VIRGINIA & TRUCKEE RAILROAD,
PENNSYLVANIA RAILROAD,
DENVER & RIO GRANDE RAILWAY,
CHICAGO, MILWAUKEE & ST. PAUL RAILROAD,
CANADIAN PACIFIC RAILROAD (VALE B. C.),
UNION PACIFIC RAILWAY (DENVER & SOUTH PARK DIVISION),
SOUTH PACIFIC COAST RAILROAD,
NEVADA COUNTY NARROW GAUGE RAILROAD,
CHICAGO CITY RAILWAY (SOUTH DIVISION),
NEW YORK, ONTARIO & WESTERN RY.,
LEHIGH VALLEY R. R.,
PULLMAN PALACE CAR CO.,
ALLEGHENY VALLEY RAILROAD,
CHICAGO CITY RAILWAY (WEST DIVISION),
CARSON & COLORADO RAILROAD,
LAKE TAHOE NARROW GAUGE RAILROAD,
UNITED STATES R. STOCK CO.,
BALTIMORE & OHIO R. R.,
NEW YORK, LAKE ERIE & WESTERN.

We are prepared to sell machines outright, or to furnish them on royalty for each pair of wheels trued. Address

CHILLED CAR WHEEL GRINDING COMPANY, CARSON, NEVADA.

Or, 246 South Clark Street Chicago, Ill.

J. B. WINSTANDLEY, Pres. GEO. E. SACKETT, Sec. and Treas. J. T. WRIGHT, Supt.

NEW ALBANY STEAM FORGE,

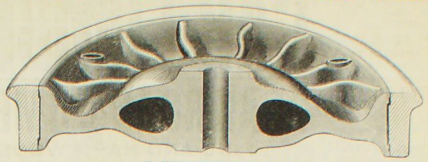
MANUFACTURERS OF

Crank Pins, Equalizers, Slide-Bars, Connecting, Parallel and Piston Rods. Heavy Forgings of all Kinds of Iron and Steel.

Office and Works, New Albany, Ind.

COOPER'S PATENT CUSHIONED STEEL WHEEL.

After four years practical trial.



Every Wheel sent out is still in use.

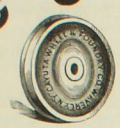
MANUFACTURED BY THE

BOSTON STANDARD WHEEL COMPANY.

P. O. Box 1,817, Boston, Mass.

Practically in use on the Boston & Providence; Boston & Lowell; Boston & Maine; N. Y. & N. England; Fitchburg and many other railroads. 1,000 wheels now in use. Send for circular.

CAYUTA CHILLED CHARCOAL WHEELS.



MANUFACTURED BY

CAYUTA WHEEL AND FOUNDRY CO.,

WAVERLY, N. Y.

A. LYMAN, Jr., Superintendent and Treasurer

L. H. TAYLOR, Pres. S. P. RABER, Sup't.
J. H. WALKER, Sec. and Treas.

TAYLOR IRON WORKS,

High Bridge, N. J.,

MANUFACTURERS OF

Chilled Iron Car-Wheels, Steel-Tired Wheels, Car and Locomotive Axles and Draw Hooks.

LANE & BODLEY CO.,

JOHN AND WATER STREETS,

CINCINNATI,

Manufacturers of their perfectly graduated stroke

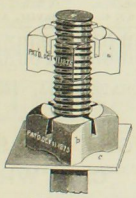
Power Mortising Machine

FOR

Car Work, Shafting, Hangers, Pulleys. Couplings and Gearing.

☞ Send for Illustrated Catalogue.

Atwood Safety Nut Co., Springfield, Mass.



J. W. LARABEE, Treasurer.

a, ATWOOD NUT on bolt without bearing on base—slots open.
b, ATWOOD NUT turned to bearing *c*, partially closing the slots and grasping the bolt.

ELBA IRON & BOLT CO.

(LIMITED),

MANUFACTURERS OF

Merchant Bar Iron,

SKELP IRON,

SPLICE BARS, RAILWAY TRACK BOLTS, CAR, BRIDGE AND MACHINERY BOLTS, NUTS, ETC.

WORKS:

ELBA STATION, B. & O. R. R.,

TWENTY-THIRD WARD.

Office: Cor. SMITHFIELD & WATER STS.,

PITTSBURGH, PA.

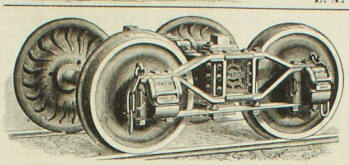
MOWRY CAR WHEEL WORKS,

CINCINNATI, O.

Manufacturers of CAR WHEELS of all descriptions. Wheels and Axles, Chilled Tires; Engine, Car and Bridge Castings, of any pattern, furnished to order at short notice. Wheels of all sizes constantly on hand.

OFFICE: No. 273½ W. Third St., Cincinnati, O.
WORKS: Eastern Avenue and Lewis Street.

L. A. GREEN, Sup't, Cincinnati, O.



THE THIELSEN TRUCK CO.,

142 Dearborn St.,

CHICAGO, ILL.

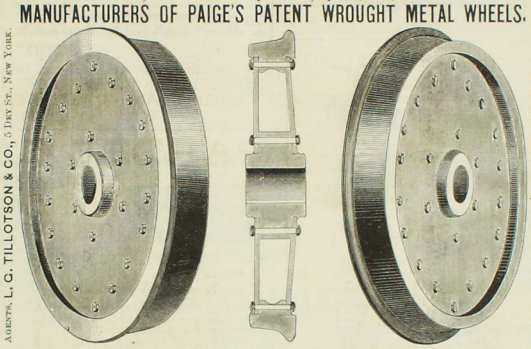
We respectfully refer you to the following railroads using this Truck: R. & D.; K. C., St. J. & C. B.; M. R. F. S. & G.; C., B. & Q.; C., A. & St. L.; A., T. & S. F.; A. & N.; K. P.; F. & P. M.; M. C.; St. L., I. M. & S.; B. & M. R. (in Neb.); D. F.; I., L. & G.; C. V.; S. C.; Baldwin Locomotive Works.

PAIGE'S WROUGHT METAL CAR WHEEL COMPANY.

Office, 18 and 20 Hampden St., Springfield, Mass.

MANUFACTURERS OF PAIGE'S PATENT WROUGHT METAL WHEELS.

AGENTS, L. C. TILLOTSON & CO., 5 DEY ST., NEW YORK.



AGENTS, SHERBURNE & CO., 80 WATER ST., BOSTON, MASS.

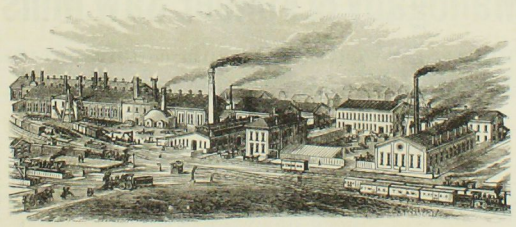
Adapted for SLEEPING and DRAWING ROOM CARS, LOCOMOTIVE and TENDER TRUCKS. Steel Tires, with ¾-in. Plates, securely bolted, making it a perfectly SAFE, DURABLE and NOISELESS Wheel.

ESTABLISHED 1853. INCORPORATED 1873.

BASS FOUNDRY AND MACHINE WORKS.

MANUFACTURERS OF

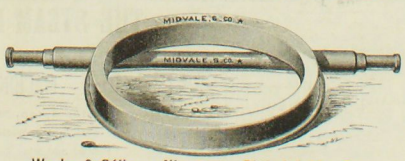
Steam Engines, Boilers, Heavy Machinery, Car Wheels and Railroad Castings.



J. H. BASS, President. J. I. WHITE, Secretary. R. J. FISHER, Treasurer.

FORT WAYNE, IND.

THE MIDVALE STEEL CO



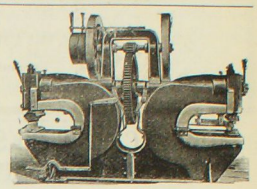
A. G. TOMPKINS & CO., Boston.
PARKER, KENNEDY & CO., New York.
W. H. WALLACE & CO., New York.
MANNING, MAXWELL & MOORE, N. Y.
GREER, ADAMS & CO., Chicago.

FOST & CO., Cincinnati.
W. H. GRAHAM, Louisville.
E. H. LINLEY, St. Louis.
GEO. A. SMITH, Richmond.
T. GUILFORD SMITH, Buffalo.

Works & Office: Nicetown, Philadelphia, Pa.

TIRES AND AXLES OF EVERY DESCRIPTION.

HEAVY CASTINGS AND FORGINGS.



Power Punches, Shears & Hammers.

We make over 100 sizes of Punches and Shears, Double and Single, varying from 500 to 30,000 pounds in weight, and adapted forevery variety of work. The Double machines are equal to two Single ones, as each side is worked independently. Also

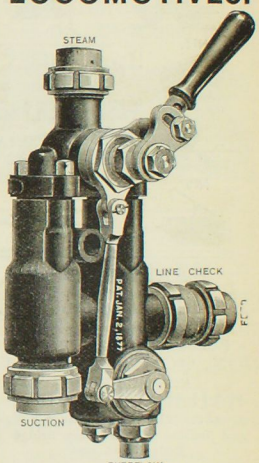
ADJUSTABLE HELVE CUSHIONED HAMMERS

Of all sizes, Unequaled for Efficiency and Durability

THE LONG & ALLSTATTER CO.,

Hamilton, O.

THE IMPROVED HANCOCK INSPIRATOR FOR LOCOMOTIVES.



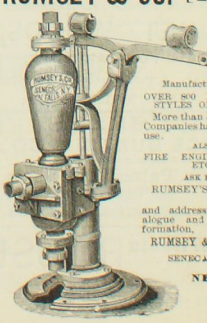
Send for Circulars and Full Particulars to

THE HANCOCK INSPIRATOR CO.

34 BEACH STREET,

Boston, Mass.

RUMSEY & CO. [Limited],



Seneca Falls, NEW YORK,

Manufacturers of OVER 800 DIFFERENT STYLES OF PUMPS.

More than 50 Railway Companies have them in use.

ALSO

FIRE ENGINES, ETC., ETC.

ASK FOR RUMSEY'S PUMPS, and address for Catalogue and full information,

RUMSEY & CO.,

SENECA FALLS, NEW YORK

THE SOPER & POND CO.,
Cor. 22d & Loomis Sts., CHICAGO, ILL.
KILN-DRIED CAR SIDING & ROOFING
OUR SPECIALTY.
Send for Prices.

CAR LUMBER

BERTHOLD & JENNINGS,
S. E. Cor. 4TH and CHESTNUT STS., ST. LOUIS.

RAILROAD LUMBER

PINE AND HARD WOODS,
OAK AND CYPRESS PILING, ETC.
Bills Sawed to Order. Large Stock Long Leaf Pine Sills Always on Hand.

W. C. BELL. J. M. BELL. S. J. BELL.
CAN MAKE RAILROADS' ORDERS A SPECIALTY.
Mills on Wolf River, at Memphis.
W. C. BELL & BROS., Memphis, Tennessee.
Orders solicited.
GUM LUMBER. WALNUT-ASH POPLAR-OAK. CHERRY.
Manufacturers of and Dealers in

BRADLEY CAR WORKS, WORCESTER, MASS.
ESTABLISHED 1833.
MANUFACTURERS OF EVERY DESCRIPTION OF
RAILWAY CARS.
OSGOOD BRADLEY, Proprietor.

MIDDLETOWN CAR WORKS,
MICHAEL SCHALL & ARTHUR KING, Proprietors,
MANUFACTURERS OF
RAILWAY AND MINE CARS.
SPECIAL ATTENTION GIVEN TO CAR REPAIRS.
MIDDLETOWN, PA.

CAR ROOFING & SIDING,

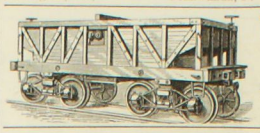
Adams & Lord, 252 S. Water St. Chicago.

AND RAILWAY LUMBER OF ALL KINDS.

SHEPARD & MORSE LUMBER CO.,
Wholesale Dealers in
Canada and Western Lumber.
SAW MILLS:
Buckingham, P.Q., Canada; East Saginaw, Mich.
STEAM MILLS FOR DRESSING:
Burlington, Vt.; Tonawanda, N. Y.

CAR LUMBER.

OFFICES:
Boston, Mass., Liberty Square, Mason Building; Burlington, Vt., 1 College Street;
Tonawanda, N. Y., corner Main and Thompson Streets.



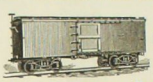
YOUNGSTOWN CAR WORKS
Railroad Freight Cars, Broad and Narrow-Gauge.
MILLIKEN, BOYD & CO.,
Youngstown, Ohio.

W. C. ALLISON,
Thirty-Second and Walnut Streets, Philadelphia,
Manufacture all kinds of Wrought and Cast Iron Work for Cars, Buildings and Bridges.
Every description of Railroad Cars, Bolts, Nuts and Washers. Also manufacture, from the best quality of iron, Gas, Steam and Water Pipe. Iron and Steel Lap-Welded Boiler Tubes.
LOCOMOTIVE BOILER TUBES A SPECIALTY.

LITCHFIELD CAR AND MACHINE COMPANY,
LITCHFIELD, ILLINOIS,
Manufacturers of all kinds of Passenger and Freight Equipment, both Wide and Narrow Gauge.
CAR WHEELS A SPECIALTY IN THE MACHINERY DEPARTMENT.
Especial attention is given to furnishing Hoisting Engines, Pit Cars, Dumps, etc., etc., for Coal Mines, as well as building Stationary Engines and Boilers, and General Brass and Sheet-Iron Work.

PENINSULAR CAR WORKS,
DETROIT, MICH.,
Operating Peninsular Car Works, Detroit Steam Forge and Adrian Car Works.
FREIGHT CARS OF EVERY DESCRIPTION.
WHEELS AND CASTINGS, HAMMERED IRON AXLES.
WORKS AT DETROIT AND ADRIAN, MICH.

PARDEE CAR WORKS.



WATSONTOWN, PA.,
PARDEE, SNYDER & CO., Limited,
PROPRIETORS,
MANUFACTURE

Mail, Baggage, Box, Gondola, Flat, Gravel, Ore, Coal, Mine and Hand Cars, Kelley's Patent Turn-Tables and Centres for Wooden Turn-Tables, Car Castings, Railroad Forgings, Rolling-Mill Castings, Bridge Bolts and Castings.
We have in connection with our Car Works an extensive Foundry and Machine Shop, and are prepared to do a general Machine Business.
ARIO PARDEE, Chairman. H. F. SNYDER, Treas. and Gen. Man. O. LEISER, Secretary.
New York City Office, Room A, 137 Broadway, C. W. Leavitt, Agent.

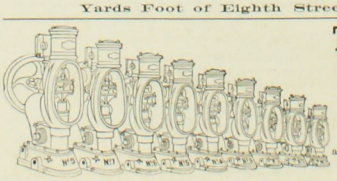
HARRISBURG
CAR MANUFACTURING CO.
MANUFACTURE
PASSENGER, MAIL, BAGGAGE,
BOX, GONDOLA, COAL
AND ALL OTHER KINDS OF
RAILROAD CARS;
Railroad Car Wheels and Castings, Bridge and Rolling Mill Castings, Bridge Rods, Bolts and
RAILROAD FORGINGS.

JOHN R. GRAHAM,
IMPORTER AND DEALER IN
ROSEWOOD & MAHOGANY,
AND ALL OTHER
FOREIGN AND DOMESTIC
CABINET WOODS,
SUITABLE FOR CAR WORK.
Cor. 11th Ave. and 30th St.
NEW YORK.

CAR SEATS.
GEORGE BUNTIN & CO.,
SOLE MANUFACTURERS OF
Buntin's Patent Car Seats,
AND NICKEL PLATED ARM CAPS, IN USE ON RAILROADS GENERALLY.
NO. 1,042 Ridge Ave., PHILADELPHIA.

WM. E. UPTEGROVE & BRO.,
Mahogany & Veneer Saw Mills.
THE LARGEST WORKS of the KIND in the UNITED STATES
FOOT OF TENTH AND ELEVENTH STS., EAST RIVER, NEW YORK.

MAHOGANY
ESPECIALLY PREPARED FOR
CAR-BUILDERS,
IMPORTED AND MANUFACTURED BY
C. C. HOUGHTON & SONS,
No. 6 Howard Street, New York.
Yards Foot of Eighth Street, East River.



THE STEAM PUMPS
MADE BY
VALLEY MACHINE CO.,
Easthampton, Mass.,
are the Best in the World for Boiler Feeding and other purposes.

WASON CAR & FOUNDRY CO.
CHATTANOOGA, TENN.
MANUFACTURERS OF
FREIGHT CARS,
CAR WHEELS,
AND
CASTINGS OF ALL KINDS.

GILL CAR M'F'G CO.,
Columbus, Ohio.
Make the best CARS and WHEELS.

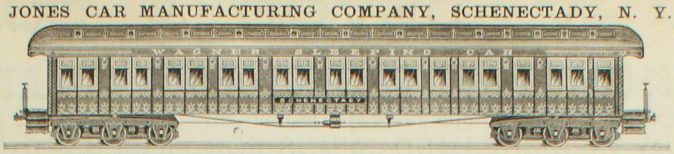
JOHN STEPHENSON CO., Limited,

STREET CARS
And Omnibuses.
47 East Twenty-Seventh St., N. Y.

Car Wheels AND CASTINGS.
RUSSEL WHEEL & FOUNDRY CO.
DETROIT, MICH.
Logging Cars AND Car Trucks.

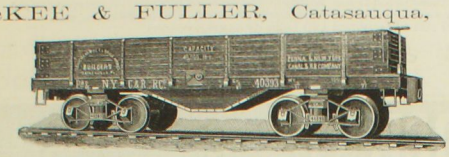
JONES CAR MANUFACTURING COMPANY, SCHENECTADY, N. Y.

BUILDERS OF SLEEPING AND DRAWING ROOM CARS AND PASSENGER COACHES.
WALTER A. JONES, Pres't and Treas.
BENJ. F. MANIER, Superintendent.



STREET RAILWAY CARS OF ALL VARIETIES, INCLUDING THE POPULAR EXCURSION OR SUMMER CAR, With all the late improvements.

LEHIGH CAR, WHEEL AND AXLE WORKS,
McKEE & FULLER, Catasauqua, Pa.,



MANUFACTURERS OF
BROAD AND NARROW-GAUGE FREIGHT & COAL CARS
OF EVERY DESCRIPTION.
WHEELS For Freight, Locomotive, Truck, Tender, and Passenger Service, HAMMERED AXLES and other forgings.
Capacity: 16 BOX-CARS PER DAY, 300 WHEELS PER DAY.
Wheels Fitted to Axles, and Prices Furnished on Application.

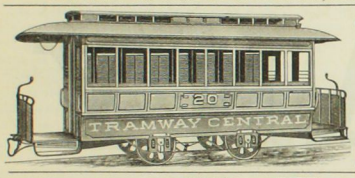
THE HARLAN & HOLLINGSWORTH CO.,
CAR BUILDERS,
WILMINGTON, DEL.
Established in - - - - - - 1836.

CORDESMAN, EGAN & CO.,
MANUFACTURERS OF THE
Most Improved and Patented WOOD-WORKING MACHINERY,
Nos. 236 to 250 WEST FRONT STREET, CINCINNATI, O., U. S. A.

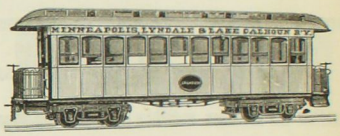
Pure Hard Curled Hair,
EITHER GRAY OR BLACK,
AND ALL GRADES OF MIXED HAIR.
N. O. MOSS, JAPANESE MOSS, FIBRE,
Wide and Narrow STRAINING WEB,
AND ALL
Stuffing Material for Car Seats and Backs.
MELLEN & CO., Manufacturers,
144 WORTH ST., NEW YORK.

ERIE CAR WORKS (LIMITED),
ERIE, PA.
Capacity 16 Cars Per Day.
FREIGHT CARS OF BEST MATERIAL, AND CONSTRUCTION A SPECIALTY.

H. M. CLAFLEN, President. J. N. ASHBURN, Secretary.
S. SHELDON, Engineer. W. REUSCHEL, Ass't Eng'r
CLEVELAND BRIDGE & CAR WORKS,
BUILDERS OF
BRIDGES AND ROOFS,
EITHER OF IRON OR WOOD. ALSO
FREIGHT AND STREET RAILWAY CARS,
WITH ALL DESIRABLE IMPROVEMENTS.
Manufacture Car Wheels and Castings of All Kinds.
OFFICE: 121 SUPERIOR STREET.
Works: Cor. Lake and Wason Sts., Cleveland, O.



J. G. BRILL & CO.,
PHILADELPHIA,
BUILDERS OF
RAILWAY AND TRAMWAY CARS.



FREIGHT CARS OF EVERY DESCRIPTION.
J. L. GILL, JR.
ALLEGHENY CITY, PA.

SOUTHERN STATES COAL, IRON & LAND COMPANY (LIMITED),
SOUTH PITTSBURG, TENN.,
BUILDERS OF FREIGHT CARS.

MICHIGAN CAR COMPANY,
JAMES McMILLAN, President.
HUGH McMILLAN, V. Pres. and Gen. Manager.
JAMES McGREGOR, General Superintendent.
Manufacturers of
RAILROAD CARS,
H. W. DYAR, Assistant Manager.
W. K. ANDERSON Treasurer.
JOSEPH TAYLOR, Secretary.
OFFICE: NO. 2 MOFFAT BLOCK, DETROIT, MICH.

DETROIT CAR WHEEL COMPANY,
Manufacturers of
LOCOMOTIVE AND CAR WHEELS. RAILROAD AND OTHER CASTINGS,
JAMES McMILLAN, President.
HUGH McMILLAN, V. Pres. and Gen. Manager.
DETROIT, MICH.
J. H. WHITING, Superintendent.
W. K. ANDERSON, Secretary and Treasurer.

BAUGH STEAM FORGE COMPANY,
Manufacturers of all Descriptions of
CAR AND DRIVING AXLES, COUPLING LINKS AND PINS, SHAFTINGS, DRAW BARS, ETC.
Works on River Road, Below City,
JAMES McMILLAN, President.
HUGH McMILLAN, V. President and Treasurer.
JOHN B. BAUGH, General Manager.
DETROIT, MICH.
SAMUEL A. BAUGH, Superintendent.
W. K. ANDERSON, Secretary.

DETROIT IRON FURNACE COMPANY.
LAKE SUPERIOR CHARCOAL PIG IRON,
FOR CAR-WHEEL AND MALLEABLE USE.
JAMES McMILLAN, President.
HUGH McMILLAN, Vice-Pres. and Treas.
DETROIT, MICH.
LEE BURT, Manager.
E. C. WETMORE Secretary.

F. W. DEVOE & CO.,

MANUFACTURERS OF

DRY COLORS, COACH AND CAR COLORS IN OIL AND JAPAN,

Special Colors Compounded to Match any Desired Shade.

FINE RAILWAY VARNISHES AND JAPANS FOR PASSENGER COACHES.

Also Freight Car, Caboose and Bridge Paints Ready for Use. Fine Brushes for Railroad Car and Coach Painting. All Kinds of Painters' Supplies and Artists' Materials.

Railroad Companies will save themselves great trouble in painting by allowing F. W. Devoe & Co. to prepare their Passenger and Freight Car Colors. This will insure DURABILITY, UNIFORMITY and ECONOMY. As we manufacture from the crude materials, which are the component parts of any shade, we understand better their chemical relationship, when in combination, than can be possible to those who simply buy their dry materials and then grind them. SEND FOR CATALOGUES AND LISTS OF SAMPLE COLORS.

F. W. DEVOE & CO.,

Cor. Fulton and William Streets, NEW YORK.

MANUFACTURERS OF RAILWAY CAR VARNISHES.

JOHN BABCOCK & Co

NO. 2 LIBERTY SQUARE BOSTON, MASS.

PARKER

CEMENT PAINT.

SPECIALLY ADAPTED FOR

FREICHT CARS, BRIDGES, ETC.

3,000 TO 5,000 BBLS. SOLD YEARLY.

MANUFACTURED ONLY BY

CARY, OGDEN & PARKER,

SPECIAL MANUFACTURERS OF

FINE COACH COLORS, TRUCK AND ROOF SHADES, WHITE LEAD, PAINTS, ETC.

235 LAKE STREET, - - - - CHICAGO.

ESTABLISHED 1845.

MOSES BIGELOW & CO.,

NEWARK, N. J.

RAILWAY VARNISHES

J. RAYNER,

IMPORTER AND DEALER IN

MAHOGANY

AND ALL FOREIGN AND DOMESTIC

CABINET WOODS.

SPECIAL INDUCEMENTS TO

CAR BUILDERS.

Mills, Yards and Wharf:

Foot Houston Street, E. R., New York.

THE A B C SYSTEM OF PAINTING

Is the SUREST, the SAFEST, the MOST RELIABLE and MOST DURABLE process of painting Passenger Cars and Engines ever brought to the attention of Railway Managers.

We know very well that to talk of anything in this apparently boastful way is apt to invite distrust from practical men who measure the value of their adjectives, but

THE A B C SYSTEM HAS NEVER YET RECORDED A FAILURE ON RAILWAY WORK.

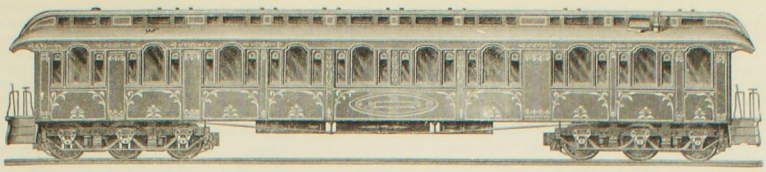
IT enables a Superintendent to *know to a day* just when he can expect his cars from the paint shop. IT *reduces* the average *time* of painting. IT *supports* the *color* and *varnish better* than any other method, and is *more durable* and *more uniform*, and *no more expensive* than any other good process. IT is now in use on th leading trunk lines, and in the best shops.

Send for our pamphlet, "HOW TO PAINT," which describes the process at length.

MURPHY & COMPANY, - VARNISH MAKERS,

CANAL AND HARRISON STS., CLEVELAND, OHIO. 231 BROADWAY, NEW YORK CITY.

THE NATIONAL CAR-BUILDER.



DEVOTED TO THE INTERESTS OF RAILWAY ROLLING STOCK.

VOLUME XIII. NUMBER 5 | MAY, 1882. | SINGLE NUMBERS, TEN CENTS. $1.00 PER ANNUM.

Miscellaneous Items.

MILLIKEN, BOYD & CO., at Youngstown, O., are building 50 coal cars for the Lake Shore & Michigan Southern road.

THE Northwestern Car & Manufacturing Co. has been organized at St. Paul, Minn. The capital stock is fixed at $5,000,000.

THE Cleveland Bridge & Car Works in Cleveland, O., are building 150 side-dump coal cars for the Lake Shore & Michigan Southern road.

MR. HENRI GIFFARD, a well-known French mechanical engineer, and the inventor of the Giffard injector, died recently in Paris, aged 59 years.

BROWN, BONNELL & CO. at Youngstown, Pa., have started their new shop, which is fitted with machinery for the manufacture of coupling links and pins for cars.

THE shops at Columbia, S. C., are substituting one Sellers injector in place of one pump, on the engines of the Charlotte, Columbia & Augusta and Columbia & Greenville roads.

THE shops of the Florida Central road, at Jacksonville, Fla., are building 6 flat cars and have one locomotive in hand for general repairs. About 30 men are employed in the rolling stock department.

THE Terre Haute Car & Manufacturing Co. is engaged on a contract for box and coal cars for the Missouri Pacific, and also has some minor jobs in hand. The company turns out an excellent quality of work.

THE train men on the Elevated roads of New York City, have nine hours of service each day, during which they make six round trips, and for which engineers are paid $3.50, conductors $2.20, and brakemen $1.65.

THE New York, New Haven & Hartford shops in New Haven, Conn., have begun to build 75 new passenger cars for the road. The inside decorations and upholstery will be furnished by Pottier & Stymus, of New York.

THE Pittsburg Car Wheel and Car Works, J. L. Gill, Jr., proprietor, are busy upon car orders. A new wood and machine shop, 100 feet square, and without any posts in the center, has recently been added to the works.

THE Virginia Iron Works are building 5 narrow-gauge moguls for the Gould syndicate. They are to have 12×16 cylinders and 40-in. drivers. Two will go to South America and two to Texas. These works now employ nearly 200 men.

MR. T. B. GAULT has resigned the position of General Agent of the Wabash, St. Louis & Pacific Railway, at Council Bluffs and Omaha, and accepted the position of General Contracting Agent for the Western Fence Co., of Chicago.

THE Bradley Car Works, of Worcester, Mass., are building 300 hopper-bottom 20-ton coal cars for the New York & New England road, 12 passenger and 100 dump cars for the Providence & Worcester, and 5 coaches for the Eastern road.

THE Louisville, New Albany & St. Louis Air Line road, which is now being pushed rapidly to completion, is receiving its first installment of passenger train cars from the Ohio Falls Car Co.'s works. The cars are models of perfection.

THE Jones Car Manufacturing Co., of Schenectady, N. Y., has begun to erect a large brick building in West Troy, which will be used for the manufacture of street cars exclusively, the building of steam railroad cars being continued at Schenectady.

CAPT. J. F. DIVINE, Superintendent of the Wilmington & Weldon Railroads, is preparing to cover the locomotive boilers of the roads under his management with Kaolin cement instead of wood lagging, after the method employed on the South Carolina road.

THE Northwestern Car & Manufacturing Co. is pushing work upon its new building at St. Paul, Minn. The main building will be 1,200 ft. long and two stories high. The company has arranged to buy out the business of Seymour, Sabin & Co.

THE Indianapolis Car Works, in Indianpolis, Ind., now employ 592 men and are turning out 12 freight cars and 108 car wheels a day. The shops have turned out 1,195 cars since they were first opened last July, and have orders on hand for a large number.

THE Eastern R. R. Co. is building at its shops at Salem, Mass., 29 passenger cars, the interior finish of which consists largely of maple and California redwood. They are to be heated by the Johnson system, and furnished with a fire-extinguishing apparatus.

A. FRENCH & Co. in Pittsburg, Pa., announce that their new works are now completed and in working order, making their capacity equal to any demand. They are prepared to ship springs from stock immediately, or to deliver springs made to order within 30 days.

THE mooted question of "the first sleeping car" has been revived again. Mr. R. Reniff writes to a Western paper that the first sleepers were two old passenger coaches fitted up with bunks, and that they were put in service as an experiment in 1859.

THE Wason Co., Brightwood, Mass., has 52 passenger cars in hand, all of which are to be completed by July 1. It is to build about 20 cars during the season for the Central of New Jersey, and has orders from the Old Colony and one of the Providence roads.

THERE are in the State of Indiana eight car manufactories located as follows: at Jeffersonville, Michigan City, Terre Haute, Cambridge City, Indianapolis, Lafayette, Elkhart and Laporte. According to the January pay-rolls they employed an aggregate of 5,950 men.

THE Galveston, Harrisburg & San Antonia Railway has enlarged its shops at San Antonio, Tex., by building an extension to the blacksmith shop 40 × 38, a new machine shop 100 × 50, a shed 200 × 36, with two tracks for repairing freight cars, and an addition of 8 stalls to the round-house.

A NEW speed indicator, called the strathmograph, for indicating the speed of locomotives, has been introduced on the Hanoverian railroads. By it the engineer can read from a scale the actual speed of his engine at any time, besides which a record of the trip is kept on a strip of paper.

W. F. TURREFF, Master Mechanic of the C., C., C. & I. road, after making experimental tests, has adopted malleable iron draw-bars for all new cars, having found they can be made with half the weight of cast iron, and that they will probably do better service. About 50 cars have already been equipped with them.

IT is reported that the Timms Car Works, Columbus, O., are in a fair way to be put upon a sound basis again. At a meeting of the creditors the liabilities were found to be only $90,000, with assets between $140,000 and $150,000. The company have several large orders on hand and will continue working at its full capacity.

THE shops of the Norfolk & Western road, at Petersburg, Va., employ about 250 men. These shops have built all the freight, baggage, mail and express cars of this division. At present, besides doing current repairs, they are building six freight cars every five days, and preparing to build two baggage cars.

THE Chicago, St. Louis & New Orleans road built in 1881, at its shops in McComb City, Miss., 8 locomotives, "American" pattern. The boilers are of steel, the flue-sheets $\frac{7}{16}$ in. and the rest $\frac{5}{8}$ in. thick. Three have cylinders 16 × 24 in., and five 17 × 24 in. Three more engines are now in process of construction in the same shops.

THE New York Central engines are to have a patent head-light made by the Kelly Lamp Works, at Rochester, N. Y. These head-lights are so made as to display the number of the engine, and also to show different colors for signal purposes, the colors being changed by mechanism worked from the cab.

THE Manchester Locomotive Works turned out in the month of March 15 large locomotives, besides several of the world-renowned Amoskeag steam fire engines, of which they are the builders. They have orders, both for locomotives and fire engines, which will keep them busy for several months.

THE Georgia Railroad has used the straight top boiler with stay-bolts instead of crown-bars for three years, and all its new engines are built in this way, but with flat crown-sheets. The domes are placed in front of the crown-sheet, and made of steel $\frac{1}{4}$ in. thicker than the shell of the boiler, and connected by a double flanged joint without any extra strengthening.

THE new shops of the Atlanta & Charlotte Air Line road, at Atlanta, Ga., built three years ago, are already too small for the repairs incident to its increasing business. These shops have the care of 30 locomotives and over 400 cars, and employ about 75 men. They are building 25 flat cars of 32,000 lbs. capacity, 10 of which are completed.

MR. N. E. CHAPMAN, who lately left the Cleveland & Pittsburg road to take charge of the Motive Power Department of the Baltimore & Ohio, had a reception given to him by prominent citizens and railroad men at Cleveland, O., on the evening of April 20. During the evening the employés of his old road presented Mr. Chapman with a costly gold watch and chain, and his wife a splendid diamond brooch.

MR. D. W. CALDWELL, late general manager of the Pennsylvania Co.'s lines west of Pittsburg, is to be vice-president and general administrative officer of the New York, Chicago & St. Louis, and president or vice-president of the Lake Erie & Western. These two roads will be operated together, and Mr. Caldwell will have control of the operative management.

AT Allegheny, Pa., March 29, a test was made of one of the United States Car Co.'s screw lever dump cars, under charge of the General Agent, Mr. F. T. Pullen. There were present Manager Baldwin of the Pennsylvania Company, Messrs. H. C. Frick, Stewart, Oliver, Mackintosh and others. The test was very satisfactory, a car loaded with 18 tons of coal being emptied in 30 seconds.

A NEW double-ender locomotive, just completed at the Altoona shops of the Pennsylvania Railroad, arrived at Philadelphia a few days since, and made a trial trip from that city to West Chester. It weighs over sixty tons, has five-foot drivers and 17 × 24 cylinders. It was designed by Mr. Theo. N. Ely, Supt. of Motive Power; burns either hard or soft coal, and is temporarily named "Jumbo."

AT the car shops of the Central Railroad of Georgia, at Savannah, during 1881, 22 passenger train cars and 1,545 freight cars were thoroughly repaired and rebuilt, and 25 new ten-ton box and 3 passenger cars were built. The box cars cost $76.57 for labor and $387.28 for material, making the average cost of each $463.85. The passenger cars averaged $3,270.57 for labor and $2,468.24 for material, making $5,738.81 for each car.

THE stock of the Westinghouse Machine Company, Pittsburg, Pa., has been increased from $200,000 to $350,000. The company was organized but a few months ago, and when fairly under way will manufacture the Westinghouse upright single-acting engines, designed chiefly for running electric light machines. The new stock has all been taken at par value, and some of it has been sold at $60 a share, which is 20 per cent. above par.

MR. J. F. BRYANT, of the Richmond, Fredericksburg & Potomac Railroad, Richmond, Va., has devised and patented a strainer for the feed water pipe, which serves the purposes of a strainer and lazy-cock. By turning a three-way cock, steam is admitted from the heater pipe, which blows out all sediment through the waste opening. This is a very desirable improvement wherever surface water is used. It is being put on all the engines of this road.

THE freight cars of the Chesapeake & Ohio road have a continuous draw-bar (one of the Middleton patents) consisting of two rods keyed in a coupling at the center, which permits compression of the draw-heads without bending the rods. The brakes are hung on the inside of the trucks and applied to all the wheels under the car; and a brake wheel at each end of the car is connected to the brake levers, so that a brakeman can apply the brakes of two cars at once.

CAPT. JOHN H. FLYNN, Master Mechanic of the Western & Atlantic R. R., Augusta, Ga., has found the following recipe an excellent one for tempering springs in oil, giving them greater elasticity and durability than when tempered in oil alone: White vitriol $\frac{1}{4}$ lb., borax $\frac{1}{4}$ lb., sal ammoniac $\frac{1}{4}$ lb., resin $\frac{1}{4}$ lb., tallow 2 lbs., and 25 gallons rock or West

Virginia oil. Powder the vitriol, borax and sal ammoniac, melt the resin and tallow, mix all in the oil, and use as a bath in the usual way.

THE Vandalia Line shops, at Terre Haute, are building two first-class coaches 54 feet long, which is an increase of four feet over the previous standard length. They have double iron transoms, and are to be mounted on 4-wheel trucks with 42-inch paper wheels, and M. C. B. standard axles. Mr. E. D. Carter, the master car-builder, is also building a combined grain, lumber, coke, coal, stock and railroad iron car, which will be convenient and durable, and costing no more than a good box car.

THE locomotive shops of the Central Railroad of Georgia, at Macon, employ over 100 men. They have five engines in hand for general repairs and are preparing to build some new ones. This road has adopted the same pattern of truck as a standard for both freight cars and tenders. The standard locomotive trucks have outside bearings, the Raoul journal-box, and the same size axles as the freight and tender trucks, which have 4-in. journal bearings and no collars. The wheels are 28 in. in diameter.

THE Swissvale Car Works, near Pittsburg, Pa., have been purchased by some prominent business men of that city, who have organized under the name of the Swissvale Car Company, Limited, with a fixed capital of $75,000. The new company has a contract with the Woodruff Sleeping and Parlor Coach Co., and will give particular attention to the building and repairing of palace cars. It will also build coal and coke cars. The works are in good running order and well equipped with machinery.

THE single-driver fast passenger locomotive, built at the Baldwin works two years ago for the Philadelphia & Reading road and subsequently sold to the Eames Vacuum Brake Co., is now running on some of the English roads, under the supervision of Mr. Eames. It is not claimed by him that the engine will beat the English locomotives in speed, but that it will run at a high rate of speed for a much longer time, in consequence of its superior heating capacity, and the quantity of water and fuel carried in the tender.

THE *Railroad Gazette* says the projectors of some of the new railroads now under way would do well to consider the remarks made some years ago by a stockholder in a Connecticut road. "You see," he said, "we knew you could not go from L— to D— without riding all around the country and changing cars three or four times. We made up our minds to build a road straight across the country, so we chipped in and built it, and then, by gosh! we found out that nobody ever did want to go from L— to D—. And then—we busted."

SOMEBODY in Chicago proposes to operate elevated railways on the Russian slide-down-hill principle; or in other words, by gravitation. The track is laid with an incline down which the cars run, and when the lower end is reached they are hoisted by elevators to the top of the next incline, and so on. In this way the cost, maintenance and weight of engines are to be dispensed with. This might work perhaps in the level streets of Chicago, but how about the time lost at the elevators when the passengers are in a hurry?

IN a recent head collision on the Charleston & Savannah Railway, which badly wrecked both engines and one postal car, no one in the passenger cars was seriously injured. Passengers in the rear cars of the trains were not made aware of the collision by any concussion of the cars, but thought that it was a regular stop. Officers of the road think that this freedom from jar was entirely due to the efficiency of the Janney coupler, and say that with any other coupling the road would have had a large bill to pay for injuries to cars and passengers.

THE fastest time ever made in this country by a train of three passenger cars was made on Saturday afternoon, April 15, when a party of journalists from Philadelphia, Baltimore and other places, were whirled to Cape May over the West Jersey Railroad. The trip of 81½ miles was accomplished in 83½ minutes. The run to Millville, of 41 miles, was made in 42 minutes. Many of the miles, especially after Millville had been passed, were covered in less than 50 seconds. The engine accomplishing this work was No. 22, in charge of Harry Reinhart.

THE shops of the North Carolina division of the Richmond & Danville road, at Company Shops, N. C., have changed a passenger coach into an officers' car for that division. The inside is finished throughout in ash and walnut. Instead of having head-linings it is ceiled with alternate strips of these woods. It is equipped with electric bells, Baker heater, Westinghouse automatic brake and the Janney couplings. The outside is painted Tuscan red, with gilt ornamentation on the door and corner posts, and a black stripe around the outside panels.

THE Petersburg R. R. has two coaches, recently built by the Jackson & Sharp Co., that are finished inside throughout with ash panels, rails, seat ends, head-linings and all, except that the window-sill caps, the facia moldings, the pilasters on the window panels and the moldings on the ceiling are of mahogany. The window sash and blind frames are of cherry and the blind slats of white wood. The seats are upholstered with cherry and green silk plush. The cushions have firm, square edges and very elastic centers, which make the seats very comfortable for the sitter.

THE Richmond & Danville road has been sending its wood-burning engines to the Southern divisions, and replacing them on the Northern divisions with new coal-burners; 18 of them, 3 passenger and 15 freight engines, have the extended front-end spark arresters. Some have plain fire-boxes, and others the brick arch. Those with the brick arch are found to be the best steamers and the most economical in fuel. In order to make them air-tight, the Superintendent of Machinery has made a new front-end casting, which has a small door 15 in. in diameter, held tight by lugs and bolts.

THE Pennsylvania Company has put on several fast stock trains between Chicago and Pittsburg, averaging 28 miles an hour, so that cattle may be got through from Chicago to Philadelphia and New York with as little delay as possible, and as few unloadings for feeding as the condition of the cattle will permit. The purpose is to run four trains a week from Chicago to New York and Philadelphia. The object is to compete with the refrigerator business, the refrigerator car now being used for the transportation of slaughtered beef being claimed as a great advantage over the live stock transportation.

IN the shops of the Chicago & Alton Railroad, at Bloomington, Ill., the holes in the locomotive flue-sheets are cut with a very convenient tool that does the work in much less time than is required by the old way. It is attached to an ordinary drill press, and can be used for holes of different sizes, and sheets of any thickness under an inch. The sheet is marked with a good center punch point for the centers of the holes, and no other preparation is required. It was devised and patented by Mr. John G. Pope, a foreman in the shop, and has been used about two years with entire satisfaction.

THE new station of the Pennsylvania R. R., in Philadelphia, is furnished with splendid Turkish rugs. The one in the ladies' saloon is 15 feet square, with a red ground, blue and purple decorations and fringed edges. The colors are subdued, and the richness of its texture is only apparent upon close examination. Its cost was not less than $900, and it was purchased with an idea of economy, the fabric being capable of standing constant use without showing early signs of wear. There are one or two smaller ones more striking in appearance, but not so valuable, having cost about $300 each.

THE Georgia Car Company, of Cartersville, Ga., has contracts in hand to build freight cars for the Macon & Brunswice; East Tennessee, Virginia & Georgia; Louisville & Nashville; Florida Central & Western; and the Florida Transit railroads. It has recently put in a new 45 horse-power engine built by the Tanner & Delany Engine Co., of Richmond, Va.; and an Excelsior & Chicago dryer, built by Curran & Wolf, of Chicago, which are working very satisfactorilly. With these improved facilities, the company propose to dry and dress the better qualities of lumber for general uses, in addition to their car-building.

THE Seaboard & Roanoke Railroad has used since 1868 a continuous draw-bar, designed by Mr. D. W. Ballentine, their car shop foreman. Their cars have only 4 sills, the 2 intermediate being placed equi-distant from each other and the outside sills. The continuous draw-bar consists of two rods about 15 in. apart, passing through both bolsters, and having a draw-bar spring on each end between the bolster and the casting which connects the ends of these 2-in. rods with a single 3½-in. rod that is attached at the outer end to the draw-head. The car is drawn by the rear bolster, the springs behind it cushioning the draft, while all four of the springs against both bolsters cushion the compression of the train.

THE Wason Manufacturing Co., Springfield, Mass., has recently built two drawing room cars for the Savannah, Florida & Western road. The outside finish is in the Pullman style, highly decorated with gilt stencil work. The interior is in solid mahogany, embellished with hand carving in Eastlake designs, and much superior to the ordinary machine work. Each car has a seating capacity for 34 passengers. There are 20 revolving chairs of a new pattern, more like those designed for household use than the conventional railroad chair. At one end is a state room with arrangements for making a bed should sickness require it. Janney couplers are used, and the platforms are adorned with plated trimmings. The cars will run between Savannah and Jacksonville. Their cost is about $9,000 each.

THE Carolina Central road is building the first locomotive erected at their shops in Laurenburg, N. C. The smallest inside diameter of the boiler is 48 in. It contains 172 2-in. tubes 11 ft. long. It is of ⅜-in. Sligo iron, except the flue sheets, which are ½ in. thick. The horizontal seams are double zigzag, and the vertical ones single rows of ¾-in. rivets, button-set throughout the boilers. The dome opening is stiffened with a ring after the specifications of Mr. Johann's boiler illustrated in the CAR-BUILDER of last January. The drivers are 5 ft. and the cylinders 16 × 24 in., with an Allen slide valve. With this boiler, which is large in proportion to the size of the cylinders, and with the Allen valve it should be a smart locomotive and very creditable to the Superintendent of Machinery, Mr. James MaGlenn, who designed it.

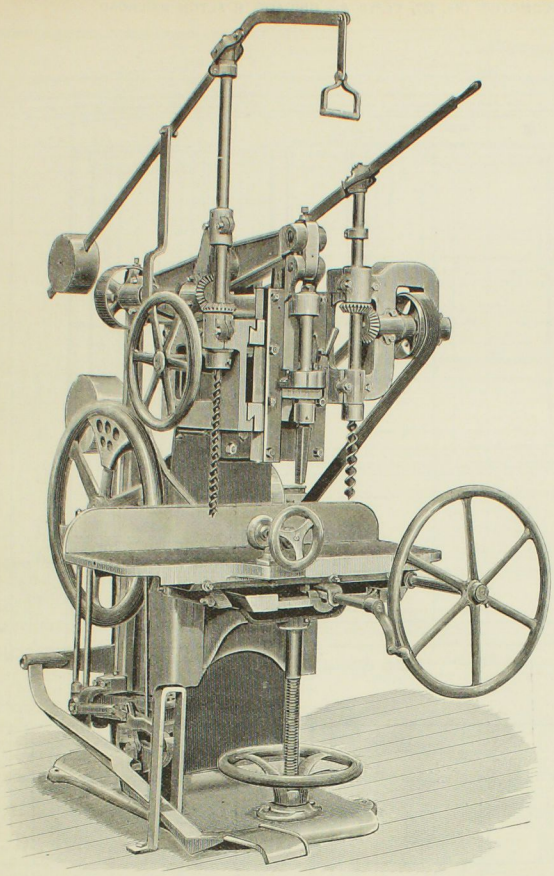
A BILL has been introduced into the Senate of New York providing that railroad corporations running palace or sleeping cars shall also have first-class carriages attached to their trains for the use of those who do not wish to pay extra fare. The extra rates for riding in palace cars shall be, for any distance of 150 miles or less, at the rate of half of one cent per mile, and for greater distance than 150 miles on the same line $1 additional, and no more for the whole distance, or so much thereof as the passenger wishes to traverse. Changing from one palace car to another shall not affect these rates. All railroads running sleeping cars may charge 75 cents, and no more, extra for each passenger for a berth for a single night, irrespective of distance, and a watchman shall be kept in each car to see that property is not stolen. Violations of the act are made punishable in the sums of $500 or $1,000 for each offense.

FOUR handsome dining cars are in course of construction at Altoona, to be used in connection with the Pennsylvania R. R., New York and Chicago Limited Express. They are on an improved plan, designed by Mr. Theodore N. Ely, Supt. of Motive Power, with special reference to the comfort and convenience of passengers. The tables are arranged to accommodate four persons each, the windows are low and wide, the upholstery and inside finish rich and attractive, and in addition to the ordinary lighting there will be four sconces holding four wax candles, over each table, to be used during meals after dark. Each car will have a conductor, and will be run with the kitchen in the rear. In addition to these dining cars, the company is also building three elaborate smoking cars, 62 feet in length, to run with the limited express. They will be furnished with sofas, arm-chairs and tables, and also a wash-room and small library.

THE Aurora shops of the Chicago, Burlington & Quincy road are full of work. The locomotive shop has been enlarged and remodeled, and new tools put in with an eye to greater convenience and facility in doing work. Among the new tools are a key-way cutter for rod and link work, a rotary planer, and a large Sellers planer which can plane a complete set of locomotive frames at once, or six to eight cylinder saddles, four cutting tools being in operation at once. The new paint shop and store room are nearly completed, and other buildings are to be erected. Two chair cars are being built. The wrecking cars destroyed in the January fire have been replaced with new ones very much like the old, except that they have heavy iron body-bolsters, and the frames are plated on the inside with ¼-in. iron sheets after the plan used in the passenger train cars of this road, thus making a very strong and rigid body. They have the standard freight car trucks.

THE locomotive shops of the South Carolina Railroad, at Charleston, S. C., employ 135 men. They have been busy the last three years in putting their locomotives (which were in very bad order, not being able to make slow schedule time with light loads) into excellent condition. The engines are now hauling larger loads, making better time, and doing their work with less fuel. Besides putting the machinery in good order, Kaolin cement has been substituted for wood lagging, and Sellers injectors for pumps. The old valves, which were line-and-line inside, have been taken out, and new ones put in with ⅛ in. outside, and from $\frac{1}{16}$ to ¼ in. inside lap, according to the service required of the engine. Many of the engines were carrying their water badly, and one of them, after its old steam chest had been planed down considerably to make a good joint, was found to carry its water worse than before. New steam chests 10 in. high in the clear were made and put on, and the engine was completely cured of working water in its steam. New chests of this size have been put on a number of engines, and all carry their water better and work steam more satisfactorily than before. These changes will continue to be made until all the engines have injectors, large steam chests and Kaolin cement covers or lagging.

MR. A. G. HOHENSTEIN, of New Haven, Conn., has invented a car coupler, which, if the claims in its behalf are well founded, and the tests to which it has been subjected are not exaggerated, leaves noting further to be desired in respect to this most important class of car attachments. The coupling is effected by simply running the cars together, and they can be uncoupled from either side or from the top of the car, whether the slack of the train is taken up or not, and upon any degree of curve. The device is adapted to all cars of standard dimensions, and to all variations in the heights of draw-bars; will not uncouple accidentally; can be so set that in switching the cars can be run together without coupling; furnishes a strong and durable buffer; and can be used with any draw-bar now in use. The ordinary links and pins are entirely discarded, and a double link-and-hook connection substituted in their stead, with a breaking strain of much greater strength. This coupler was recently tested at New Haven in the most thorough manner, and under the supervision of a large number of prominent railroad men, the result being in every respect satisfactory. Let the public generally rejoice that a quietus has been given to this interminable problem. It may be bad for the business of the patent bureau, but it is a boon indeed to trainmen. In saying this, we assume of course that the claims and tests will be subject to no modification in the practical working of the device.



HEAVY CAR MORTISER AND BORER.

This is one of the heaviest, strongest and best constructed machines of its class. The driving parts are placed at the base, which is large enough to support the machine without top bracing. The stroke is varied by the treadle. When the treadle is up there is no motion to the chisel; as the foot is pressed down the motion of the chisel is increased. Any part of a 14-inch piece of timber can be mortised without reversing it. The machine has an auxiliary boring attachment. A special belt motion is applied directly to the auger, which allows it to be moved to any point across the work for general boring. The fixed auger is placed in a line with the mortising mandrel, so as to be used in connection with the same. The movement of the mortising tool is 5 in.; movement of the auger, 16 in.; capacity of table, 16 × 16 in.; height of machine, 7 ft. 6 in.; base, 4 ft. × 2 ft.; weight, 3,500 lbs. The countershaft has tight and loose pulleys, 15 × 5 in., which should make 240 revolutions per minute. Chisels, machine bits, and long bits for boring bolts, each of various sizes, are furnished with the machine. Manufactured by Goodell & Waters, Philadelphia.

Railway Passenger Trains in Germany.

In Germany, says a writer in *Engineering News*, passenger trains are made up of mixed coaches, that is, such as have sub-divisions for first, second or third-class passengers. They are much smaller in length and lighter than the American coaches, and look a good deal like box cars in shape and size. Each car has from five to eight or nine compartments, each complete in itself and having no connection with those ahead or behind, and having only a door, with movable glass top on each side, as a means of entrance and exit. These doors have the handle on the outside, so that when once closed they are virtually locked, imprisoning to a certain extent those inside. The only way for a passenger to open the door is to let down the glass side and reach out to the handle, which, however, is strictly forbidden on all German roads, and just as strictly enforced, too.

The conductor walks a gang plank on the outside of the car to collect tickets, after which he is supposed to enter a little watch-tower attached to one of the cars of his section—this has the appearance of a small dry goods box perched on the end and side of the coach, and makes a comical appearance. Passenger trains are under control of a head conductor, with several sub-conductors, all uniformed, the latter having each from two to three cars in charge. As soon as a station is reached, each sub-conductor opens the depot side of all of his compartments, calls out the name of the station, and regulates as much as possible the disposition of new travelers in his coaches. These sub-conductors seem to be usually quite susceptible to bribes, which generally insures the traveler a whole compartment to himself and friends or family. In first-class compartments there is place for six persons; the seats are made of rich velvet or plush upholstery, and trimmings to a certain extent decorative and tasteful. The second-class has room for eight persons; the seats are also upholstered, but not so well finished. The third-class, which is the one mostly used by the people at large, has wooden seats and place for ten persons. There is yet a lower class—the fourth—operating, however, on only some of the roads. This class is intended for hucksters carrying truck to the cities, and is only local. The coach has no compartments, and what is strangest of all, no seats. The passengers are huddled together promiscuously, and find standing room as best they can.

One instance of the want of providing even the most necessary comforts, is the total absence of drinking water or water-closets. Where the latter has been attended to, a notice is posted in each compartment that a closet is provided in one of the baggage-cars; those desiring to use same must apply to the conductor, and at the next stopping place you are given the key, and naturally you must remain in there until the train reaches another station. This is probably one of the most absurd expedients that could have been hit upon.

Couplings are made in a very efficient manner, but altogether too slowly; you never hear of a detached car or broken sections. Everything around the depots has a neat, clean and orderly appearance; all employés, except laborers, are uniformed, and as most of them are retired army officers and soldiers, their bearing is strictly military. At all road crossings at grade-level, there is a watchman, who works the barriers on approach of trains. He is notified by telegraphic signals, works the barriers whether a wagon is there or not, present arms, or rather safety flag, to the passing train, and then walks the track until the next train passes. They are provided with little houses immediately at the crossing and live there entirely. These little watch-houses are sprinkled all over the road every few miles apart. The substantial manner in which the road-beds are originally constructed does not require constant section and floating gangs of laborers, and the watchmen report the condition of track on their beat. Road repairs are, therefore, comparatively small on German roads.

Recent Reports of Railway Rolling Stock.

Chicago, Burlington & Quincy.—The equipment at the close of 1881 was as follows:

	Roads east of Mo. River.	Roads west of Mo. River.	Total.
Engines	413	71	484
Passenger cars	155	48	203
Palace and dining cars	6		6
Baggage, mail and express cars	75	13	88
Box and stock cars	10,864	1,997	12,861
Platform and coal cars	2,971	1,971	4,942
Caboose and way cars	222	33	255
Officers' and pay cars	5	2	7
Service cars	15	5	20
Hand and push cars	993	374	1,367
Total number of cars			18,849

Additions during the past year were 43 locomotives; 19 passenger, 1 state-room and 4 baggage cars; 1,404 box and stock, 768 platform and coal, and 33 way cars; 1 officers' car, 1 pay car, 1 wrecking and 7 boarding cars; 118 hand and push cars.

Wabash, St. Louis & Pacific.—551 engines; 200 passenger, 16 chair, 2 parlor, 4 dining and 131 baggage, mail and express cars; 9,001 box, 1778 fast freight line, 2,247 stock, 5,115 coal and flat, and 322 caboose cars; 1,234 leased cars; 3 officers' and 3 pay cars. Total cars, 20,056. The increase during 1881 was 93 locomotives; 55 passenger and 15 baggage, mail and express cars; 4,032 freight cars. The company has also equipment of 3 ft. gauge on the Havana, Rantoul & Eastern, and the Des Moines & Northwestern roads as follows: 10 engines; 5 passenger, 2 combination and 6 baggage and mail cars; 224 box, 57 stock, 159 coal and flat and 2 caboose cars.

Cleveland, Columbus, Cincinnati & Indianapolis.—150 engines; 59 passenger, 6 sleeping, 2 parlor, 17 baggage and express and 7 mail cars; 2,743 box, 625 stock, 664 flat, 1,206 coal and 69 caboose cars; 1 directors' 1 pay and 12 service cars. Total cars, 5,412. The equipment of the Cincinnati & Springfield road is 16 engines; 15 passenger, 6 baggage and 2 postal cars; 99 box, 94 stock, 79 coal and 11 caboose cars. Increase during 1881, one passenger, one postal, and 952 freight cars. There are 1,000 car trust freight cars on the road.

Kentucky Central.—10 engines; 18 passenger, 10 baggage, 218 box, 40 stock, 73 flat and 6 caboose cars. The equipment was reduced during the past year by the sale of old engines, the gauge of the road having been changed. Since then, 12 engines and 217 box cars have been ordered and delivered, making in all 22 engines and 574 cars.

Housatonic.—22 engines; 26 passenger, 2 mail and smoking and 8 baggage cars; 182 box, 14 hay, 338 flat and 2 caboose cars; 1 wrecking car. Total cars, 573.

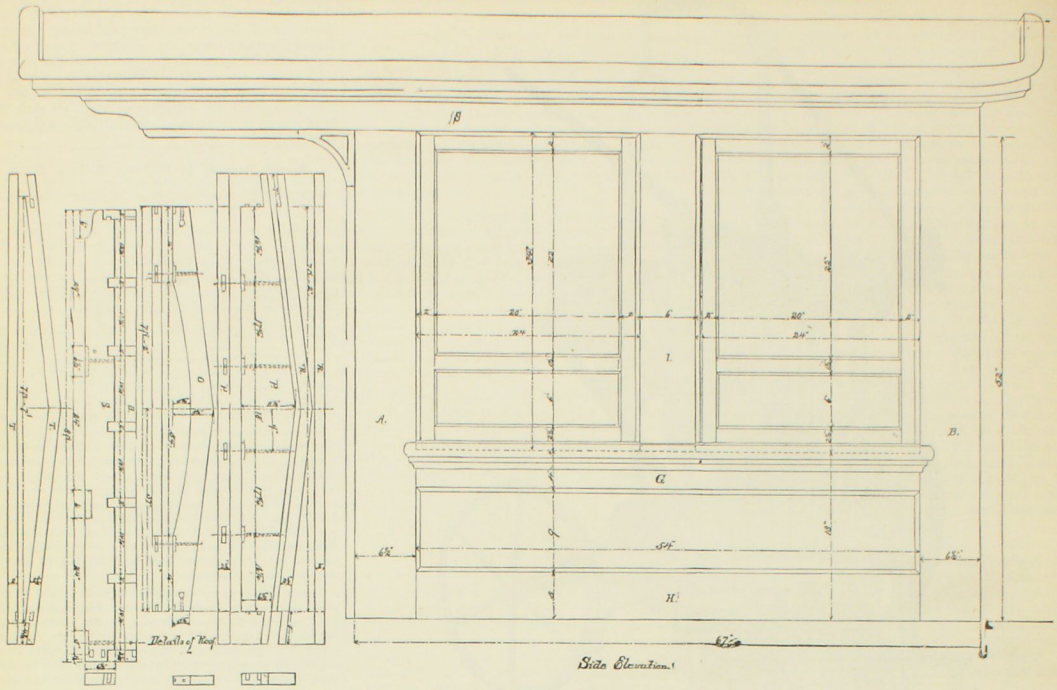
Richmond, Fredericksburg & Potomac.—11 engines; 15 passenger, 3 mail and 6 baggage and express cars; 51 box, 33 flat and 6 caboose cars; 12 material cars. Total cars, 126.

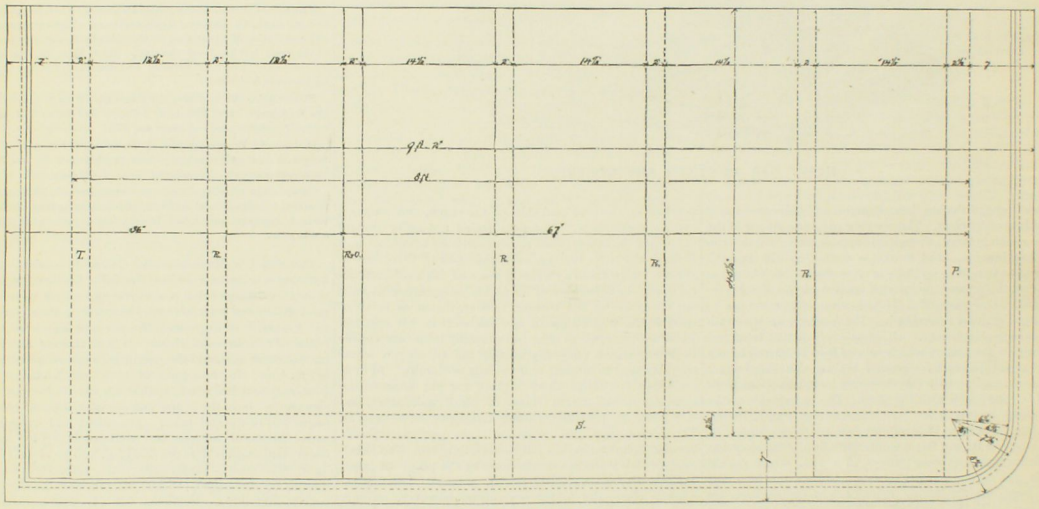
United States Rolling Stock Co. owned Dec. 31, 1881, 21 locomotives, 1 baggage and 4,758 freight cars, as against 23 locomotives, 1 baggage and 4,833 freight cars at the end of the previous year.

THE Gill Car Manufacturing Co., of Columbus, O., are building a train of cars for the Sells Brothers' traveling show, consisting of flat, box, stock and other cars. The most showy and attractive one, however, is the advertising car, intended for the use of the advance agent in giving notice of coming exhibitions. It is 62 ft. long and 9 ft. 6 in. wide over sills, and the height between sills and plates is 7 ft. 1 in. In the center of each side is a large panel door, and near it a window, the only ones in the car. The side panels above the center rail are of glass, and also the upper half of the end doors. The raised roof extends the entire length of the car and contains 43 pivoted sashes. Good ventilation is thus provided for, and an abundance of light. The interior is arranged with reference to the service to be performed. There are shelves, drawers, cupboards, and other receptacles for advertising matter, a number of Pullman sleeping berths on each side, and a central apartment for the private use of the agent. There is also a paste room containing an upright flue boiler, steam pump, tanks, and various appliances for facilitating the work of the showman. The finish is in ash and maple panels trimmed in walnut, and the metal trimmings are bronzed. The outside of the car is a masterpiece of thorough workmanship, both mechanical and artistic. It is sheathed up with box-car siding of white pine, perfectly dry, and slanting diagonally towards the center. Upon this are placed three thicknesses of ¼-in. basswood and maple veneer, glued together and fastened to the sheathing with white lead and screws. It is then dressed off by hand, ready for painting and ornamentation, which are very elaborate, including life-like portraits of the four Sells Brothers, gorgeous Oriental scenes, etc., executed with the highest artistic skill. The car rides on 6-wheel trucks, has Miller platforms and couplers, and Westinghouse automatic brakes. It was designed by Mr. Howard Carlton, the Superintendent of the Gill Car Works.

"JUMBO" hurt his foot in coming over, and a Chicago girl who was on board loaned him one of her old slippers. She said his ears reminded her so much of her Milwaukee young man.

CAB OF STANDARD PASSENGER LOCOMOTIVE (No. 137, CLASS A.), CHICAGO & ALTON RAILROAD.





HALF PLAN OF ROOF.

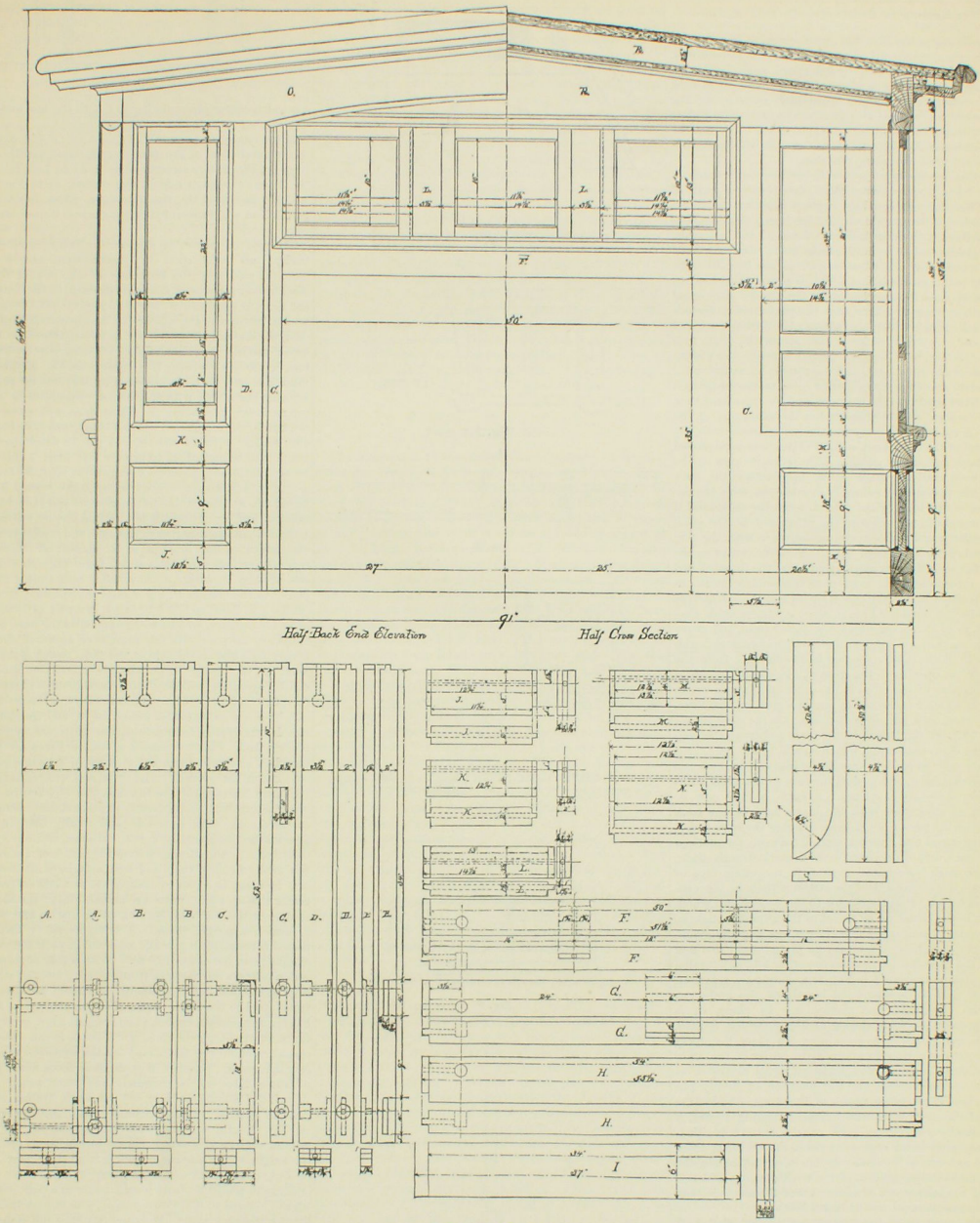
THE engravings on this and the opposite page illustrate in detail the construction of the engine cab of the Chicago & Alton Railroad so clearly that further description is unnecessary. We append the following statement of cost of material and labor:

COST OF ENGINE CAB—CHICAGO & ALTON R. R.

250 ft. Ash Lumber	@	3c.	$7.50
36 " Black Walnut	"	8c.	2.88
60 " Clear Pine (moldings)	"	4½c.	2.70
85 " " " Ceiling	"	4½c.	3.82
85 " "B" Sheathing	"	3c.	2.55
40 " White Wood Panels	"	3½c.	1.40
85 sq. ft. Canvas	"	4½c.	3.82
2 Lights Glass, 12×22	"	18c.	36
2 " " 10×22	"	15c.	30
4 " " 20×22	"	27c.	1.08
2 " " 10×12	"	6c.	12
2 Drip Pipes, ⅝×3½	"	2½c.	05
1 Paper 12 oz. Tacks			11
2 " 1 in. Brads	"	12c.	24
1 " 1¾ in. No. 14 Screws			40
2 lbs. 6-penny Cut Nails	"	3½c.	07
2 " 8-penny Finish Nails	"	4½c.	09
2 " 6-penny " "	"	4½c.	09
3 " White Paint	"	10c.	30
¼ " Glue	"	22c.	11
34 ⅝-in. Joint Bolts—27 lbs.	"	3c.	81
34 " Nuts—4 lbs.	"	6c.	24
68 Washers—5 lbs.	"	5c.	25
2 Cast-Iron Cornice Brackets—14 lbs.	"	2c.	28
2 No. 1 Thimbles	"	5c.	10
3 lbs. Drop Black	"	30c.	90
7 " Lead Color	"	10c.	70
4 " Green	"	10c.	40
16 " Mineral	"	6c.	96
3 " Putty	"	6c.	18
1 Book Gold Leaf			37
1 Qrt. Rubbing Varnish			1.00
1 Pt. Locomotive "			50
1 Quire Sand Paper			20
Total cost of materials			34.88
Planing Room Labor		5.00	
Carpenters' "		30.00	
Blacksmiths' "		.50	
Machinists' "		.10	
Painters' "		8.80	
Add 15 per cent. for dead labor		6.66	51.06
Cost of labor			$85.94
Total cost of cab			

THE following rules should *not* be observed by those who write for the press: 1. Write on a large sheet of paper, say about the size of a pane of window glass. 2. Write on both sides of the sheet and cross-line the margins. 3. Use sky-blue paper and very pale ink, or a hard lead pencil. 4. Write in a flourishing microscopic hand, with small spaces between the lines. 5. Abbreviate all words of more than three syllables. 6. The names of persons and places may be written in a scrawling way; the printer can always make them out from the context. 7. Every sentence should end with a dash or wriggle of the pen instead of a period; the rest of the punctuation will take care of itself. 8. Every tenth word should begin with a capital letter, unless it happens to be the name of a hotel, palace car or steamboat, in which case a small letter may be used. 9. Underscore for italics a portion, at least, of every other sentence; it makes the reader absorb the meaning so he will never forget it.

ACCORDING to *Texas Siftings*, the chief duties of a hotel clerk consist in hammering on the call bell, handing guests the wrong keys to their rooms, and keeping a supply of toothpicks on the end of the desk.



DETAILS OF CAB.

THE London & Northwestern Railway has purchased the right to use chemical stoves in its cars—stoves or cylinders filled with hyposulphite and acetate of soda heated at the central station by being immersed in boiling water and then put in the cars, where they give forth the heat equably, and for a long period of time, their effect lasting ten or twelve hours.

AN exchange says that there is an interesting experiment in life insurance in progress, conducted by the Baltimore & Ohio Railroad Company for the protection of its employés. The Baltimore & Ohio Relief Association, a sort of mutual company, substantially managed by the railroad, was organized about two years ago, and from May, 1880, to the beginning of the present year, issued 22,150 policies, and at the time last mentioned had 13,105 in force. In the period indicated it also paid claims amounting to $200,816, of which $74,769 were for sickness, $11,678 for physicians' bills, $83,047 for injuries by accidents, and $30,420 for deaths. Besides making these payments the company has exercised a sort of general sanitary oversight upon its members through a regular force of doctors, and also looked after the sanitary condition of all the railroad company's shops, cars and grounds. It is said that the effect of this work has been plainly perceptible in the exemption of employés from malarial diseases. And, in pursuance of this idea, when smallpox became epidemic in some parts of the country a few months since, the insurance company vaccinated all its members, and in some cases their families as well.

THE Savannah, Florida & Western Railway's six new coaches mentioned in our last issue, are 46 ft. long over sills and seat 54 persons. The inside finish of four of them is with cherry rails and moldings and ash panels, except the wainscot panels, which are cherry. The head-linings are decorated hard maple put up with cherry moldings. The window blinds, both frames and slats, are of white birch. The inside finish all shows the natural colors of the woods, except the ash window panels, which are stained a little deeper color than the cherry moldings. The seat-ends are cherry, and the seats are upholstered in cherry and green plush. Opposite the closet is a lavatory, separated from the main room of the car by a partition the same as the saloon, and the side next to the aisle is left open. There are three double lighted chandeliers, and a Spear stove in the center at one side, taking the place of one seat. Besides the lavatory for the comfort and convenience of passengers, these cars when in use have a strip of carpet through the aisle the whole length of the car, and a cuspidor and matting to every seat. The windows are large, and with the light woods in panels and head-linings, the effect altogether is to make it a very cheerful and pleasant car for passengers. The outside is painted chocolate color, with gold and black decorations. This road uses a metallic instead of a lead body for the painting of cars. The other two cars are the same outside and have the same style of head-linings, but the inside finish is of cherry throughout, blinds and all.

Communications.

Overhauling of Locomotive Driving Boxes.

To the Editor of the National Car-Builder:

In overhauling the driving boxes, etc., of locomotives, different plans are adopted by individual gang bosses for marking off the shoes, wedges, etc., each plan, as a rule, being considered by the user superior to all others. The one herewith presented and illustrated by the cuts differs in many respects from many other plans now in use, and the writer believes that in some of its points it will be an improvement upon prevailing practice.

Fig. 2 shows the front jaw, with the shoe and wedge in place; *b* is a wooden center-piece, faced with a strip of tin. This center-piece is held in place between the frame and binder, at the outside edge of the frame, thus bringing its face flush with the outside side faces of the pedestals. If the guides and cross-head are in place, the cross-head is set in the center of its travel in the guides by getting the striking points of the piston. This is accomplished, when the piston is not in the cylinder, by the use of a stick equal in length to the piston-head, plus the projection of the follower bolts plus the distance between the piston-head and cross-head. A straight-edge is laid across the front face of the cylinder, and the stick passed through the piston-rod hole in the back head, and then pushed forward until it is distant from the straight-edge equal to the projection of the front head into the cylinder, and the cross-head then pushed forward until it just touches the other end of the stick. A mark is then made on the guides even with the front end of the cross-head wing, and the cross-head moved to the back end of the guides. The stick is now to be pulled back until the mark on it representing the back side of the piston-head comes flush and even with the inside face of the back cylinder head, when the cross-head is again brought in contact with the other end of the stick and another mark made on the guides even with the forward end of the cross-head wing. Find the center on the guides between the two marks, and bring the forward end of the cross-head wing even with this middle mark, in which position it is in the center of its travel. If neither the guides nor cross-head are in place, a longer stick may be used, as in Fig. 5, on which the piston-head and cross-head are marked as shown in their relative positions; also the length of the main rod—that is, the distance from the center of the opening in the strap of one end to the center of the opening of the strap in the other end, as shown in Fig. 6, in which *b* is the center, and *a* a steel keying liner, which, when used, should be in place. On the stick shown in Fig. 5 lay off the length of the main rod from the center of the cross-head wrist, which should be located. This stick may now be passed through the piston-rod hole in the back cylinder head, and pushed forward to the front striking point, as already explained. A mark *a* may now be made on the stick even with the *inside* face of the back head. Push the stick a short distance out of the front end of the cylinder and find a center mark *b* between the mark *a* and the back face of the piston-head as marked on the stick. Bring the mark *b* flush and even with the inside face of the back cylinder-head, and the piston is then in the center of its travel. Returning now to the cross-head, which was left in the center of its travel in the guides, a stick *w*, Fig. 3, equal in length to the main rod less half the diameter of the cross-head wrist, may be placed with one end against the cross-head wrist and the other brought parallel with the frame, as shown in Fig. 3; *w* may now represent the stick used to represent the length of the main rod when the cross-head and guides are in place, or it may represent the stick shown in Fig. 5, which is used when the guides and cross-head are not in place, the object being to get the correct location of the center of the main shaft, so that the piston may leave an equal clearance at each end of the cylinder, and the main rod be finally put up with the brasses in the center of the straps. Unless the center of the shaft is located by the foregoing means, it may be finally forward or back of the correct position, which necessitates the brasses on the main rod being lined forward or back, as the case may be, to accommodate the change made in the position of the shaft's center, and this lining of the brasses out of the center of the straps in *shop* work is unmechanical and at best a botch.

Having found, then, the correct position of the shaft center, as explained, it is necessary to establish it on the piece *b*, Fig. 2. In Fig. 3, *a a* is the top of the frames, *w* the stick referred to, *j* is a straight-edge placed against the side faces of the pedestals *i i*, *l* is a square placed against the straight-edge *j* and end of stick *w*, and *k* a short straight-edge placed against the square and extending in and touching the piece *b b*, Fig. 2, by which means a point *g*, Fig. 2, is located. By means of a large square with one blade resting on the top of frame *e*, Fig. 2, and the other extending down even with the point *g*, the line *cc* is drawn and a center punch mark made at *f* on the frame, which locates the shaft's center for any future overhauling. This line is then squared across the top of the frame, as shown at *h* in Fig. 3. Two points *f* and *g*, equally distant from *h*, are then laid off centrally on the top of the frame. With one point of a pair of trams set in *g* and then *f* the arcs *d e* and *b c* are drawn, and through their intersection the straight line *x y* is squared, which by construction is necessarily squarely across and in line with the mark *h*. A line similar to *cc*, Fig. 2, is now to be squared down on

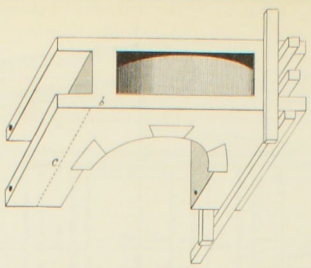


Fig. 1

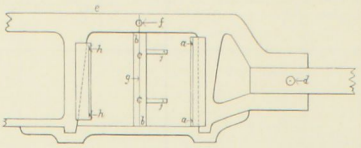


Fig. 2.

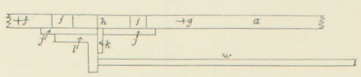


Fig. 3.

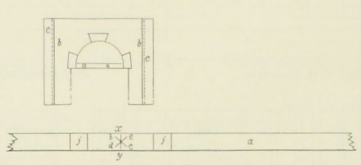


Fig. 4.

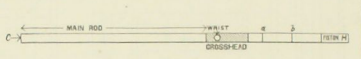


Fig. 5.

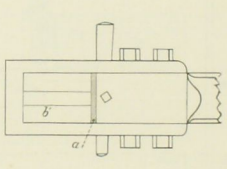


Fig. 6

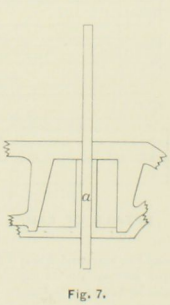


Fig. 7.

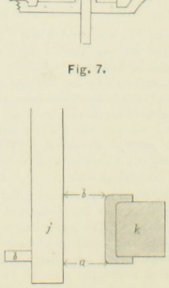


Fig. 8.

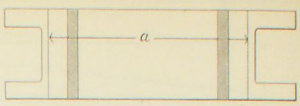


Fig. 9.

a wooden center-piece, similar to *b b*, in the jaw under the line *x y*.

If the engine is a very old one, and any doubt exists as to the parallelism of the frames and consequently of the lines *c c*, Fig. 2, two straight-edges may be held fair with the lines *c c* on each side of the engine, as in Fig. 7, in which *a* is one of the straight-edges, when any want of parallelism will be seen by sighting across the two straight-edges.

The gibs or brasses of the driving boxes having been backed up with sheet or Russia iron, the distance from the wedge to the shoe face of the box at the top shall be compared with the same distance at the bottom of the box, to ascertain if the backing up of the gibs or brasses has spread the legs of the box apart. If such is the case, the distance from the wedge to the shoe face at the top of the box should be marked off centrally on the bottom of the box—*a* being this distance in Fig. 9. This distance line may then be continued up the side of the box, running out in line with the shoe or wedge faces at the top as shown by *c* in Fig. 1. These lines will serve to set the box by on the planer. On an examination of the shoe and wedge faces of the box it can be determined how much is to be planed off to bring a fair face. This point being determined, a second line, parallel with the face line, as in Fig. 4 (*c* being the face line and *b* the second line referred to), will determine to the planer-hand how much to take off, and by setting the box to this line no mistake can be made. An examination of the shoe and wedge faces will also determine how much is to be planed off them, and this may be indicated by a short temporary line on the side of shoe or wedge. A wooden center-piece may be placed in the box, as *B*, Fig. 4, and the distance from the center *a* to the shoe line *b* be taken in a pair of compasses or inside calipers, which, being applied to the line *cc*, Fig. 2, toward the shoe, will fall something short of the temporary face line on the side of the shoe, which is the thickness of the liners to be placed behind the shoe. A similar operation will determine the thickness of the liners for the wedge. The opposite driving box should also have a wooden center placed in it, and its shoe face line drawn equally distant from the center as in the first box marked. This will insure, when the boxes are planed together, a sufficient amount of stock in the right place to bore out of the journal. The shoes and wedges having the necessary liners pinned on to them, the thickness of which being ascertained as previously explained, they should be surfaced onto the pedestals and finally held in place against the pedestals by a bolt or stick placed between their faces. The distances from the center of the driving-box to the finished shoe and wedge faces of the box may now be taken in a pair of compasses, and laid off from the center line *cc*, Fig. 2, onto the outside side of the shoe and wedge at the top and bottom, and a line *aa* and *hh*, Fig. 2, drawn through them. A straight-edge *i* should be passed through each jaw and adjusted at each end equally distant from the center line *cc*. With a pair of hermaphrodite calipers the distance from the edge of the straight-edge to the face-line of the shoe *aa* should be taken and transferred to the inside of the shoe, as shown in Fig. 8, *b* being the wooden center, *i* the straight-edge, *aa* the distance referred to, *j* the shoe, and *k* the pedestal. The same operation should be performed for the opposite shoe, and also the wedges, which will cause their faces when planed to these lines to be parallel, and save much filing. A point *d* should be laid off on each frame with a pair of trams, equally distant from the center line *cc*, Fig. 2, and on line with the center of the axle. Similar centers to *bb* being placed in the back jaws, and the length of the side rod (which is from the center of the opening in the front end of the strap to the center of the opening in the back strap) being taken in a pair of trams, which, applied to the center line *cc*, will furnish the center line for the back jaws. The back box-shoe and wedge-face lines and liners being found as for the forward ones, and planed and surfaced, the driving boxes may be placed in the jaws with the shoes in place and the wedges up. A wooden center being placed in each box and the boxes blocked up between the cellars and binders on a line with the mark *d*, Fig. 2, the boring circle of one of the forward axles may be drawn on the end of the brass or gibs, and the distance from the center of this circle to the mark *d* be taken in a pair of trams and applied to the same mark on the opposite frame, marking the center of its box, from which the boring circle can be laid off. With the length of the side rod in a pair of trams, the back axle centers may be laid off from the forward ones, and their boring circles drawn, when the boxes may be bored out. It is customary in many shops to bore out the two forward boxes and one back box first, put them in place in the jaws, find their centers on a wooden center-piece, take the distance between the front center and the back centers on one side in a pair of trams, and with the trams lay off the distance between the centers on the opposite side with

a view of correcting any error of the boring of the three boxes which may have occurred. Fig 1 shows the ordinary mode of transferring the shoe and wedge faces of the driving box to the outside by means of straight-edges.

The writer thinks the location of planing lines on both the outside and inside side faces of the shoes and wedges, as shown in Fig. 8, and planing them after the liners are pinned on, a much better plan than pinning them on after the faces of the shoes, etc., have been planed; for if the liners are not exactly of a thickness, the faces of the shoes and liners will be thrown out of line, and they must be corrected then with a file and straight-edge after they are in place in the jaws.

FRANK C. SMITH.

Color-Blindness, Science and Nonsense.

TO THE EDITOR OF THE NATIONAL CAR-BUILDER:

Most railroad men are familiar with the rules and regulations that are being adopted with respect to color-blindness of railroad employés. Examinations have disclosed the fact that a great many of these employés have defective vision, which it is claimed renders them unfit for service, and as a measure of safety they are discharged.

Every thing that contributes to the safety of the traveling public should receive the earnest attention of railroad officials and of the legislative authorities; but there is room for much injustice to employés in the enforcement of some of the laws that have recently been enacted on this subject.

It is expected, of course, that great care will be exercised in the selection of men to fill responsible positions, but there is a possibility that too much mere professional science may b brought to bear upon the matter.

A few years since the good people of Massachusetts were horrified to learn that many of the locomotive engineers on the roads of that State were color-blind, and scientific experts were at once employed to detect the men who were afflicted with the dangerous infirmity. One of the men who was examined had stood at the throttle of a passenger engine for sixteen years, during which time the trains he had run carried millions of people without an accident, and he was familiarly called the "old reliable." He perfectly understood the meaning of all the colored targets and semaphores by day, and the different colored lights by night. He was always detailed to run trains requiring extra care and skill, and thousands who had come to know him felt safe when he was on the engine. But on an evil day a man of science came along with a basket of worsted yarn of a hundred colors, more or less, and "old reliable," having never been employed in a hosiery establishment, failed to match the different shades as a trained expert would do it, and the shocking discovery was then and there made that millions of passengers had in all those years miraculously escaped death at the hands of the engineer who could not match worsteds, and he was thereupon summarily "worsted" and ousted.

A shudder ran through New England at the appalling discovery that there were a score or more of railroad operatives in their very midst who were not experts in discriminating delicate shades of color. The dangers to which the traveling community had been exposed were none the less real because they had been escaped. But in future there is nothing to fear. All these men whose defective vision through years of faithful service had brought never a one to grief, have been removed, and their places filled by others who are at least competent to run haberdashery shops, whatever may be their accomplishments in the handling of locomotives. This, I submit, is a gross injustice to a most worthy class of men, and it is to be hoped that such doings will not gain a permanent foothold in our railroad practice.

In a recent examination of a large number of railroad operatives, it was discovered that two brakemen, who had been in service eighteen years, could neither read nor write, and they were immediately discharged. They had the misfortune to be illiterate; and had their places been filled with a couple of college professors, a great many people would probably have breathed easier. Years ago, a New England village blacksmith lost one of his eyes through some mishap. Not liking his trade, he found employment as locomotive fireman, and in a few months he was engineer of a construction train. In a few months more he was running freight, and was finally promoted to the throttle of a fast passenger engine. This was thirty years ago, and he is now running passenger trains through the valleys and along mountain sides, and there is no safer man than he. The truth of the matter is, he has *no* eye for anything but his own business. His visual defect has not yet been discovered by the authorities, but when it is discovered he will probably give place to some man whose "luck" in handling trains is not a whit better, and it may be, not as good.

In saying this much, it must not be inferred that as a rule it is safe to employ men in such capacities who labor under physical or mental disability; but I do say, and say it with emphasis, that to discharge men for some trivial defect, fancied or real, who have served for years in the most satisfactory manner, is the sheerest nonsense, absurdity and injustice. It may be argued that illiteracy, the loss of an eye, or inability to match worsteds are not trivial defects; but it is a fact, nevertheless, that hundreds of competent and trustworthy men who are deficient in some of these points, are dismissed from employment as often as the man of science happens arounds with his basket of colored yarns. Science is certainly a good thing in its way, and so is consistency, which is not unfrequently called a jewel. It is a well-known fact that the loss or permanent injury of one organ or a limb of the body increases the strength of the remaining ones. The loss of one eye gives additional power to the other, total blindness renders the hearing more acute, and it is the same with respect to legs and arms. The consciousness of any particular defect reinforces all the other faculties of mind and body by way of compensation. There is a freight brakeman on one of the roads running from Chicago who is as deaf as a post, but his efficiency in his vocation is such that he would not be exchanged for any other man in the land. Nothing escapes his vision. He always moves at the right time and in the right direction; is always on hand when wanted, the first to discover anything wrong, and is always the main dependence in an emergency. But science will find him some day, and a musical director will probably fill his place—on the pay-roll. Reliability derived from experience is the prime qualification for positions of responsibility on railroads. To weed out such men and cast them aside at the bidding of scientific theorists, is neither politic nor safe. If color-blindness is as dangerous in railway practice as these theorists say it is, it is not to their credit that they have suffered all these thirty years to elapse before warning people of their danger.

WM. S. HUNTINGTON.

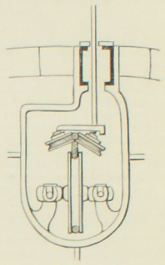
Fast Railroad Lines.

The innovation of the Pennsylvania Railway in its fast trains between New York and Chicago suggest comparisons with lines abroad. The famous Flying Dutchman on the Great Western Railroad, England, makes the run from London to Exeter, 194 miles, in four hours and fourteen minutes. With four stops it attains a speed of almost 46 miles an hour. A train on the Great Northern Road makes the distance from London to Leeds, 187 miles, in four hours—almost 47 miles an hour, with four stops. The train carrying the Irish mail to Holyhead, over the London & Northwestern line, and dubbed "The Wild Irishman," has now sunk into comparative obscurity with its rate of a little less than 40 miles an hour. The morning express on the Great Northern Road makes only four stops along the line from London to Edinburgh, 395 miles, and flies over the whole distance in nine hours, with an average rate of 44 miles an hour; and on the Midland line the night Scotch express runs the 425 miles to Glasgow with a speed of 40½ miles an hour. These are the four swiftest trains in England, and, as will be seen, the Leeds express, with its rate of 47 miles an hour, is the fleetest of them all. Three out of the four trains probably beat the running time for the same distance on any other roads in the world. They are all, however, far out-stripped for a shorter distance by the train on the Pennsylvania Railroad, which leaves Jersey City at 4:10 P. M., and makes the run of about 88 miles to Philadelphia in 100 minutes, with one stop, at Trenton. The 52.8 miles an hour made by this American train is probably without parallel in the schedule time of any railroad company on the globe. On both the American and English railroads it must also be remembered that for short stretches of straight track, with good road-bed and favoring grades, a speed of 60 miles an hour is not very uncommon.

The Cable System of Street Railways.

The underground cable system of propelling street cars, which has been in successful operation for several years in San Francisco, bids fair at no very remote period to supercede the use of horse-power for that purpose in other cities. It may be said to have passed the experimental stage before a trial of it in Chicago was seriously thought of. The difficulties to be overcome in perfecting the details of the system so as to meet the practical requirements of a heavy street line traffic were perhaps as great in San Francisco as they are likely to be in any city in the country, owing to the hilly nature of the ground, the grades ranging from 83 feet in 1,925 to 307 feet in 2,800. That these difficulties have been permanently surmounted is evident from the fact that four lines are now in operation in that city, the first one having been opened for traffic in September, 1873, and the last in February, 1880. The success of the plan, both in a mechanical and economical point of view, could hardly fail to induce other cities to try it, and especially a city like Chicago, with its long, straight and level streets, and populous and growing suburbs. It has proved a success there, already, and will doubtless be introduced sooner or later in New York and Philadelphia, where so many unsuccessful attempts have been made to use dummy motors in place of horses. The mechanical details of the method can not be fully understood without the aid of elaborate drawings; but a tolerably correct idea of the essential features may be formed from the following brief description and accompanying cuts.

The track in its surface appearance is like an ordinary horse-car track, with the exception of a narrow longitudinal slot or opening in the center through which the connection is maintained between the cars and the wire cable underneath. The two diagrams represent the surface of the track, and a cross section of the tube or tunnel under the road bed, in which are the pulleys on which the cable runs, and also the gripper which clutches or releases the cable, the former being operated from the car by means of the shank connection through the slot. This grip arrangement is not uniform on all the San Francisco roads, but the same mechanical principles are involved in its construction. It is compact and powerful, can pick up the rope at any point, hold it loosely so as to start or stop cars gradually, or so tightly that there is no slipping. It also carries the rope high enough to prevent contact of the gripper with the pulleys in passing. The upright shank and gripper may be operated either by a lever or screw. The space between the two light center-lines in the track diagram, represents the slot or opening, which is about ⅞ of an inch wide, and is placed a little to one side of the center, so as to prevent dust, dirt or water that may work in, from falling directly on the cable. The shank of the gripper is about ⅝ of an inch in thickness, which leaves ¼ inch play in its travel through the slot. The tube under the road bed is of iron, and is about 20 inches deep by 14 wide, with no opening except at the top, as shown.



The rails have to be carefully laid, and the play between them and the wheel flanges reduced to a minimum.

The ropes used in San Francisco are about 1 inch in diameter, and consist of 114 crucible steel wires divided into 6 strands. One gripper dummy can take from one to three cars. The average speed is six miles an hour. A steam pipe runs through the tunnel, to be used in case the slot should become obstructed by ice. There are many other details more or less complicated, providing for inequalties of surface, the crossing of other lines, terminal arrangements, getting round curves, etc., which it is not necessary to notice in this article, which is only intended to convey an idea of the leading features of the system.

As to the comparative cost of running the horse and cable systems, the detailed statements contained in the San Francisco *Mining and Scientific Press*, of Sept. 3, 1881, are somewhat astounding, and are as follows, omitting details:

Running expenses per annum of a horse railway, with 32 cars, each seating 22 passengers, speed 4½ miles an hour, 2½ minutes between starts, on 3 miles of double track, $138,880.

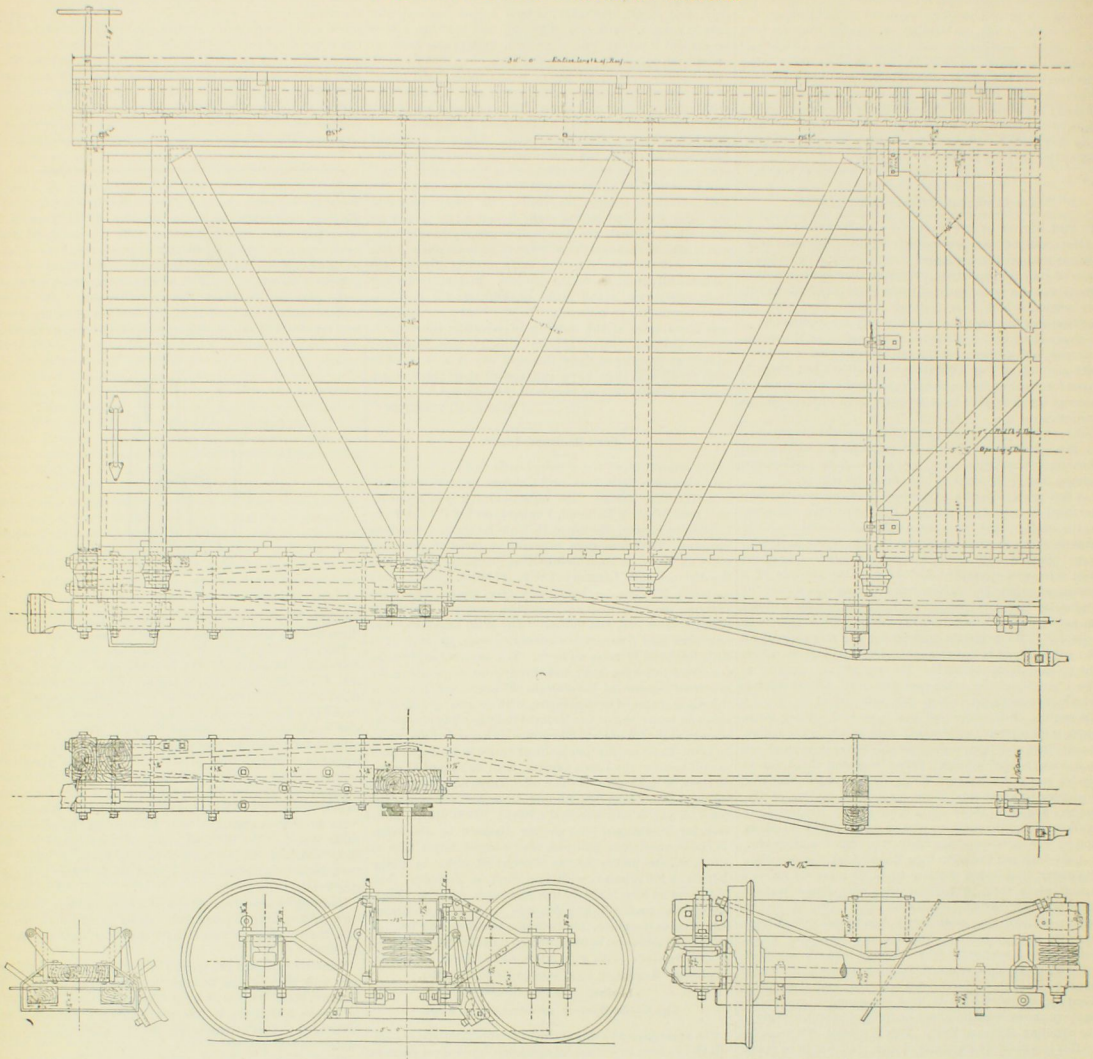
Running expenses per annum of a cable railway, with 12 cars and 12 dummies seating 44 passengers to car and dummy, speed 6 miles an hour, 5 minutes between starts, on 3 miles double track, $59,085—making a difference in favor of the cable system of $79,794, or more than 57 per cent.

These estimates, of course, do not include original cost of plant and equipment.

A Three-Truck Freight Car.

The latest innovation of importance in the way of car-building has developed in St. Louis in the way of a three-truck freight car. Mr. Terry, some two years ago, conceived the idea of putting an additional truck under a freight car as an economical means of increasing the carrying capacity of the car, with only a moderate additional expense in construction. He got the privilege of putting his idea on the Iron Mountain Railroad, and to a couple of ore cars he put the truck, midway between the end trucks, the only expense being the cost of the trucks and a few timbers and irons to fasten them. The result was that they were able to load the cars with double the former weights without any signs of damage or breakage. The cars have now been running quite two years in the ore service, and the master mechanic has made a statement that the repairs on the three-truck car have been only nominal as compared with the old style. The matter has been kept quiet thus long to determine to a certainty the value of the plan by an actual test of sufficient time. An effort is being made now to bring the invention out, and to that end a train of ten cars is to be put on the Chicago, Burlington & Quincy Railroad, fitted up with three trucks to a car. As soon as this is done the same experiment will be made on other roads. It is claimed that the cars thus equipped will haul double their former capacity with very little increased motive power required, while on curves in the track it operates as readily as a two-truck car. In the construction of a car the additional cost of the third truck will not exceed $150.—*Age of Steel.*

STOCK CAR—RICHMOND & ALLEGHANY RAILROAD.



GENERAL DIMENSIONS.

Length of body and end sills	33 ft. 0 in.
Width of body over side sills	8 " 6 "
Height, bottom of sill to top of plate	8 " 5 "
Door opening	5 " 6 "

SIZE OF TIMBERS.

Outside sills	clear yellow pine	5	x 9	in.
Intermediate sills	" " "	4	x 8	"
Middle sills	" " "	4	x 9	"
End sills	white oak	7½	x 9	"
Bolsters	" "	7	x 14	"
Tie bolsters	" "	5¼	x 10½	"
Buffer blocks	" "	4	x 9	"
Draft timbers	" "	4	x 6½	"
Brake beams	" "	3½	x 6½	"
Two blocks of white oak between draft timbers		3½	x 6½	"
End plates	clear yellow pine	3½	x 12	"
Side plates	" " "	3½	x 6	"
Ribs—center rib of	" " "	2½	x 3½	"
Intermediate ribs	white oak	1¾	x 3½	"
Carlines	" "	2	x 10½	"
8 Posts, wh. oak...at bottom		3½	x 3½	"
16 Posts, " " ... "		3½	x 3½	"

CONSTRUCTION.

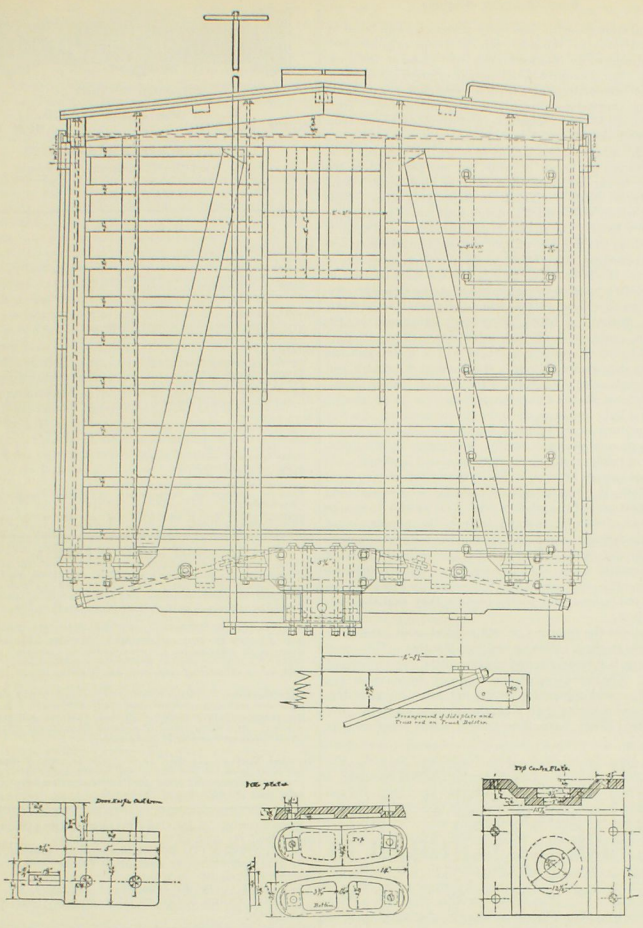
Long sills double tenoned into end sills; end sills to project 2 in. beyond side sills. Distance between tie bolsters 6 ft.; between middle sills 8⅛ in.; between outside and intermediate sills 19 in.; from center of bolster to outside of end sills 5 ft. 5 in. Draw-heads of cast-iron, secured with 2-in. round bar extending through bolster and tie bolsters to center of car. Follower plate 1 in. thick, 7 x 8½ in. Springs 6 x 5½ in. King bolt 1⅝-in. round iron, 12 in. long, with solid round head 3 in. in diameter, to rest on top of plate. Two 1⅜-in. truss rods enlarged at ends to 1¼ in., extending through end sills, over bolsters and under tie bolsters; also two 1-in. truss rods, 1⅜-in. ends, passing through bolsters and over center sills, and to have wrought-iron plate ⅝ x 4 x 14 in. long, on ends of bolsters. Carry bar of wrought-iron 1 x 3 in. Posts 7 ft. 2 in. long between shoulder at pocket and shoulder at plate, and set in cast-iron pockets. End and side braces 2 x 5 in.; carlines 2 x 4½ in. wide at ends and 10½ in. at center; 9 slats of oak on each side and ends. Doors 5 ft. 9 in. wide and 7 ft. 2 in. long, of white oak, stiles 2 x 5½ in., top rail 2 x 5½, middle and bottom rail 2 x 7 in., slide bar on inside 2 x 6 in. Flooring of 2-in. oak, 6 to 8 in. wide; roof ⅞-in. clear white pine, well seasoned, and dressed both sides, 6 in. wide, with gutter ⅞-in. wide and ¾-in. deep, 1 in. from edge of boards—boards to be laid double thickness. Running board 1 in. thick and 18 in. wide. Ladders on right-hand corner of each end of car, with five ⅝-in. round iron steps, also iron step under sill at each right-hand corner. Brake-staffs 1¼-in. round iron, brake wheels 14 in. in diameter and to stand 2 ft. above roof. Safety hooks of ⅝-in. round iron; center of draw-heads 34 in. above rail. All joints to be well painted before putting together, and car body to have three coats of dark brown point.

Along the Zigzag.

"It's a funny country where you have to travel three miles in going 200 feet, and where they pump oil in their front yards and dig coal in their gardens, and I've just got back from a trip in that country," said commercial traveler John Gilbert in the Astor House rotunda not long since.

"I struck it two weeks ago in Western Pennsylvania. I thought I had been on crooked railroads, but I never rode on one before where, if you happened to be in the rear car, you could shake hands with the engineer of your train every five minutes. That road I took from Oil City down the Allegheny Valley, and it landed me at Foxburg, Clarion County. A range of hills 200 feet high climbs from the valley there, and there is just room enough between it and the river for one street and a row of buildings. Then the rest of the town hangs on the face of the mountain. Some of the people can look out of their back windows plumb down the chimneys of their neighbors. Once a resident of Foxburg thought his winter stock of vegetables was going rather faster than it should. He investigated, and found that a neighbor living a lift or so below him had run a chute from his cellar up through the the bottom of the cellar of the gentlemen above him, and had laid in his supplies by stealth and the laws of gravity.

"A railroad starts from Foxburg and goes up into the interior of Clarion County. The depot is on the street at the foot of the hill. The train starts away from the station like mad. It runs up a steep grade for three-quarters of a mile and stops. Then it backs up another grade at the rate of twenty miles an hour, and stops again so suddenly that you think it must have telescoped with one of the houses. It has gone half a mile. In a few seconds, whiz! it goes forward again, up hill for three-quarters of a mile, and stops once more. Then it starts backward as if it had forgotten something, all the time going up grade. When it stops with a bang it has gone three-quarters of a mile or more, and then you are at the top of the range, looking down on the spot you started from, and on which you can



toss a stone from the car window. You've had nearly three mile's ride, and are only 200 feet on your journey. That railroad runs for thirty miles or so through the wildest country I have ever tried to drum up trade in. There are lots of towns, but they're all in the woods. There is an oil well about every rod, and it's a common thing to see them pumping away in their door yards. The whole country is a bituminous coal field. Every farmer has what he calls his 'bank' of coal, and townfolk dig it in their gardens alongside of the potatoes. When a man tells his wife to go fetch some coal for the fire, out in that country, she takes a shovel and a basket, goes out in the lot, and harvests enough in five minutes to last all night."—*Metal-Worker.*

Car-Builders' Monthly Meeting for April.

This meeting, which is understood to be the last one of the season, was devoted to the subject of car couplers. A number of models were exhibited, and their merits and peculiarities explained by the inventors. There was no regular discussion. What was said was mainly conversational, and as it related to the construction and operation of the various devices as shown by the models, a report of it would not be intelligible to the reader without the models; and even if we could represent these by engravings, there is no way to show in print how they were operated.

A car-coupling arrangement must be seen to have its merits appreciated, as every inventor and railroad man will be ready to admit. We might note opinions and criticisms that found expression in side remarks touching this or that device, but we do not care to agitate a hornets' nest when there is no absolute necessity for it. So far as we can judge from the brevity of the explanations (each exhibitor being limited to ten minutes), the couplers were all highly creditable to the inventors, and should receive the favorable consideration of railroad men. With regard to this class of devices, generally, it occurs to us that the only defect that is apparent in the best of them is a lack of uniformity! The great object now is to do away with the diversity which exists in the styles and patterns of car attachments. If a dozen or two of the very best draw-bars and couplers could by some process be selected from the mass, and then if these could be simmered down to one, and this one style universally used as a standard, it would be the beginning of a railroad millenium.

Among those exhibited at the meeting was the Perry Safety Car Coupling. The inventor, Mr. W. V. Perry, of Chicago, insists that "coupling" is the proper term, and not "coupler," and we give him the benefit of his preference. His coupling seems to be very well liked on some of the western roads, where it has been in use for a considerable time, and it is now being introduced in New England. It is said to meet every requirement, and to be an absolute protection to the men who do the coupling. The draw-head is very strong, and none of them in service have been known to break, nor have the pins ever been broken by direct draft.

The Everit Automatic Coupler was explained by the inventor, Mr. W. L. Everit, of New Haven, Conn. The model exhibited was life-size, made mostly of cast-iron, simple in its construction, and requiring but little skilled labor in its manufacture, and, consequently, can be furnished at a comparatively small cost.

A number of other couplers were exhibited, but we have not been able to obtain a list of them.

THE freight car trucks of the Virginia Midland Railway have a wing or arm cast on to the transom casting to which the brakes are hung. This arrangement relieves the bolster springs of all strain from the brakes, and there is no risk of loose iron straps from the wearing of the wood, the breaking of bolts or the loosening of nuts. During the year they have used brakes attached in this way, not a single casting has broken or a brake become loosened, as is the case so frequently when a piece of iron is bolted to the wooden spring-plank or bolster. The brakes are now applied to all the wheels of a freight car without any increase in the power of the brake-wheels and levers used in applying them. Ten years' experience has demonstrated that the full power of the brakes can be applied in this way without sliding any wheels, and the train will be more effectively controlled by the brakes.

Proposed Change in the Organization of the Master Car-Builders' Association.

A circular addressed to "Railroad Presidents, Managers and Superintendents," has been issued by the committee appointed at the last annual meeting of the Car-Builders' Association on the subject of a proposed change in its organization, providing for the admission of a new class of members, with written authority from some one of the chief officers of the roads to represent their respective interests in the association. The nature of this change is indicated by the following amendments to the constitution of the association which are now pending, and the action upon which, at the annual June meeting, will depend to a great extent upon the responses that in the mean time are made to the circular:

ARTICLE III.

"SEC. 1. There shall be three classes of members, Active, Representative and Associate members.

"SEC. 2. Any person holding the position of Superintendent of the Car Department, Master Car-Builder, or Foreman of a Railroad Car Shop, or one representative from each Car Manufacturing Company, may become an Active Member by signing the constitution, or authorizing the President or Secretary to sign for him, and paying his dues for one year.

"SEC. 3. Any person having a practical knowledge of car construction may become a Representative Member by receiving a *written* appointment from the President, General Manager or General Superintendent of any railroad company, to represent its interest in the Association. Such members shall have all the privileges of active members, and in addition thereto, on all measures pertaining to the adoption of standards for car construction, or the expenditure of money, they shall have one more vote for each thousand cars the company which they represent owns. In the enumeration of four, six or twelve-wheeled cars, four axles to count as one car. The dues of representative members shall be in proportion to the whole number of votes they are entitled to cast. Their membership shall cease if their appointment is revoked by any officer authorized to make it, or when such a member leaves the employ of the company by which he was appointed."

It was also proposed that no road should have more than one representative member, but no action was taken on it.

The entire circular is too long for our space, nor is it necessary that we should print it in full, as it has doubtless already been read and digested by most of the railroad officers for whom it is designed. Suffice to say that the origin and objects of the association are duly set forth, and also the fact that it is a purely voluntary organization, with no power to carry into effect any measures that may be agreed upon in respect to the construction of cars, or with the view of making such construction more uniform. The recommendations of the association in past years in reference to screw-threads, height of draw-bars, and the form and dimensions of a standard axle, are referred to as having been productive of good results; also the rules adopted to facilitate settlements for repairs of interchange cars. Statements are given showing the existing diversity in the patterns and sizes of journal-boxes, brasses, brake-shoes, draw-bars, axles, etc., upon four leading roads. The mismating of wheels and the variation in their nominal sizes are referred to, and the enormous losses consequent upon a continuance of the existing diversity in the details of construction. The variety of methods and patterns in freight car attachments, and the numerous accidents in coupling cars, are also cited in further illustration of the necessity of greater uniformity in these and other respects. The conclusion of the circular is as follows:

"The committee have been instructed to get the opinions of the chief executive and other officers of railroads concerning the proposed plan of reorganization of the association. As the matter will come up for consideration and final action at the next annual convention, to be held in June, the committee solicit from you a brief letter saying whether you approve of the measure or not, and whether, if it is carried out, without any objectionable conditions, your company would probably appoint a representative to the association, with any other comments you may be inclined to add. Such a letter will have its due influence in procuring either the adoption or the rejection of the proposed amendment to the constitution. The committee hope that you will favor them with an early reply, which should be addressed to M. N. Forney, No. 73 Broadway, New York."

LEANDER GAREY,
W. T. HILDRUP,
M. P. FORD,
C. A. SMITH,
M. N. FORNEY,
} Committee.

THE Cedartown (Ga.) shops of the Cherokee R. R. have built all the cars used by the road except five, which were bought when it was first opened. About 30 men are employed in the shops. An average of one new car a week is built besides current repairs and rebuilding. The standard freight car of the road is 31 ft. long by 7 ft. 8 in. wide over body. The box cars weigh 16,000 pounds and carry 26 bales of cotton; the flats weigh 10,000, and both are intended to carry a maximum load of 12 tons, although a box car loaded with ore by guess was weighed after running 14 miles, and found to have a load of 35,000 pounds. The company has a foundry in which all its castings are made, and a new brick round-house with nine stalls is now being built. The foundations are refuse slate, and it will be roofed with corrugated iron. The road also buys old axles of wide or standard gauge, cuts them off, turns new journals, and in this way gets axles that cost about $4.50 each; 30-inch freight wheels are used.

The Carrying Capacity of Freight Cars.

The following circular has been issued by the committee on this subject appointed at the last annual meeting of the Car-Builders' Association. In order that the committee may prepare their report and have it printed prior to the annual meeting in June next, early replies to the interrogatories are requested. The replies should be addressed to C. A. Smith, 113 Liberty street, New York.

CIRCULAR.

ASSOCIATION ROOMS,
113 LIBERTY ST., NEW YORK, March 30, 1882.

At the last annual meeting of the Master Car-Builders' Association the undersigned were appointed a committee to obtain information, with reference to the carrying capacity of freight cars, and to obtain the opinion of railway officers as to the advisability of increasing that of freight cars, above twenty tons.

It is only a few years since freight cars were allowed to be loaded with more than ten tons. At the present time, but few eight-wheel cars are built with a carrying capacity of less than twenty tons. From this fact, we infer that twenty-ton cars can be run as safely as ten-ton cars, and that freight can be transported with greater economy in cars that have the greatest carrying capacity.

The increase of freight traffic upon our leading railroads during the last five years has been very large, and if it had been necessary to transport it in ten-ton cars the expenses for motive power and train men, cost of maintenance of the greater number of cars, etc., would have been enormous. Road beds and bridges are made more substantial than in former years. Locomotives have of late been made of enormous weight and power, and are so successful and satisfactory, that railway managers still continue to build them. If these heavy locomotives can be run without serious injury to road beds and bridges, are there any objections to increasing the load of freight cars? There are so many advantages to be gained thereby, with so few and trifling objections.

The following are considered a few of the most important advantages that may be derived in transporting any given amounts of tonnage in thirty-ton cars:

Less cost of cars; less cost of repairs; less dead weight; less number of waybills to make; shorter trains; shorter side tracks less coupling and uncoupling of cars, and damage to drawbars and fixtures; less number of brakes to operate; less number of journal boxes to oil; less number of wheels to inspect; less train men; and many other smaller advantages.

The following table showing the number of 10, 20 and 30-ton cars, to transport 1,000 tons of freight, with cost of cars, weight, length, etc., will show the great economy in the use of cars having the greatest carrying capacity. The cars taken are box-cars:

TONNAGE	1 car capacity.	Number of cars to carry 1,000 tons.	Weight of cars to carry 1,000 tons.	Cost of cars to carry 1,000 tons.	Length of train to carry 1,000 tons.	Weight of trucks to carry 1,000 tons.	Number of wheels to carry 1,000 tons.	Number of axles to carry 1,000 tons.	Number of journal bearings to carry 1,000 tons.	Number of journal bearings to carry 1,000 tons.	Number of bolster and draw springs to carry 1,000 tons.	Number of draw bars to carry 1,000 tons.	Number of draw timbers and fixtures to carry 1,000 tons.	Number of draw-bar stops to carry 1,000 tons.	Number of brake beams to carry 1,000 tons.	Number of brake shafts, levers and connection to carry 1,000 tons.	No. of brake shafts, levers and connection to carry 1,000 tons.
Tons.	Tons.		Tons.		Feet.	Tons.											
1,000	10	100	1,000	$57,000	3,100	450	800	400	800	800	600	200	400	800	200	900	500
1,000	20	50	550	30,000	1,550	250	400	200	400	400	300	100	200	400	100	450	250
1,000	30	34	412	21,450	1,440	175	272	136	272	272	204	68	136	272	68	306	170

In order to make a report on this subject, the Committee are obliged to obtain information with reference thereto, from practical railroad men. They will, therefore, be greatly obliged if you will give your opinion upon this matter and answer the following questions:

1. Have you found any difference in the wear or breakage of wheels under ten or twenty-ton cars?
2. Are the wheels under your twenty-ton cars of greater weight than under ten-ton cars. If not, do you think they should be?
3. Have you found any difference in the wear of journal bearings upon ten and twenty-ton cars?
4. Have you found that journals under twenty-ton cars wear out faster than under ten-ton cars?
5. Have you had more hot boxes under twenty-ton cars than under ten-ton cars?
6. Have you found it necessary to use more expensive oil upon twenty-ton than under ten-ton cars?
7. Have repairs to draw-bars and fixtures and other repairs under twenty-ton cars been greater than to ten-ton cars?
8. Do the bodies of twenty-ton cars show greater deflection from their original lines than ten-ton cars?
9. Have the twenty-ton cars increased the repairs to road bed, rails or bridges?
10. In your opinion can freight cars of 34 and 40 feet in length be run as safely as shorter cars?
11. In your opinion can the carrying capacity of freight cars be increased from 20 to 25 or more tons with greater economy than to carry freight in twenty-ton cars?
12. If the carrying capacity of freight cars should be increased to 30 tons, would you recommend journals and axles to be made larger than the Master Car-Builders' standard, and that wheels be increased in weight?
13. Can a locomotive draw 1,000 tons of freight over your road, in twenty-ton cars, with greater economy than in ten-ton cars?

C. A. SMITH, 113 Liberty street, N. Y.
J. N. MILEHAM, Jersey City, N. J.
C. E. GAREY, Morrisania, N. Y.
Committee.

IN high society circles in New York, it is a grave question as to whether folding the napkin after dinner, or throwing it carelessly on the table, is the "propah capah." In Western Texas the upper ten do not worry over such trivialities. They wipe their mouth on their sleeves.—*Texas Siftings.*

Rural Railway Stations.

Rural stations, with their daily passengers numbered by the individual or the score, can not compete in architectural grandeur or interior luxury with those of the great towns. But they have the advantage of more elbow-room. Ampler surroundings give them a wider choice of means in making themselves presentable and attractive. Turf, flowers, shade-trees, fountains and terraces are at their command—all beautiful, manageable, and not costly. In England, where no one is allowed to set foot upon the rails, the stations are often in pairs, one on each side of the double track, and decoration of this kind must, consequently, be doubled. Yet it is thoroughly done. Neat gravel walks, well sodded and well-kept flower-beds appear on either hand. The slopes of embankments and excavations along the line are utilized for spade-husbandry and market-gardens, brightening at each station into plats of flowers. It will be a long time before the value of land in this country justifies the occupation of the slopes by anything but sheep and cattle—which ought not to be there, either, without a fence. Improved sightliness of the stations, however, is of easy attainment. The introduction of habits of ordinary neatness will be a first and important step, showing itself in the removal of rubbish, and the smoothing of the surface of the ground. Hardy plants, of which we possess a long list, will grow, with the protection of a light inclosure, and the encouragement of a few hours' culture in the course of the year, as readily as weeds. Turf is in most places as easily at command. If the building is of brick or stone, or any unpainted material, the Virginia creeper at least, if the latitude forbids ivy, will soon clothe it. Not merely in planting would beginning be a great part of the whole work. The person in charge would acquire an interest and pride in the appearance of his little demesne, especially should the railroad company have the taste and judgment to make embellishment of this character a part of its fixed system. Some companies are doing this, and others will follow, partly because it becomes the fashion, and partly because they find their account in it.

What else the company would in most cases have to do is a little grading, inclosing and tree-planting. This once well done is permanent, and requires little nor no annual outlay. The protection of the roadway from wash has obliged several companies to expend large sums in terracing and covering with grass the light sands in the cuts and fills. They have thus bought some experience as armers and horticulturists which they may put to good use when they discover the utilitarian side of a row of handsome and homelike stations. People who see such a spot every few minutes as they whirl along form a liking for the route. They speak of its occular attractions to their friends, and these, too, in future select the path that is set with flowers. One road thus bedecked teaches the traveler to look for the same attraction in others, and these will learn that it is worth while not to disappoint him.

The in-door features of stations are less clamorous for reform than their purlieus. They are, for the most part, well warmed, capacious and well lighted. Ventilation is about as good as that of an average city house. Neatness, if not all it ought to be, is clearly on the mend. The long pew-like rows of immovable hard-bottomed settees are not exhilerating, it is true. Perhaps they are maintained as being the most loafer-proof seat, the typical person of that genus preferring one which he can move about and wherein he can attitudinize *ad lib.* He probably finds himself repelled, too, by the atmosphere of these hard, unsocial benches and the blank walls surrounding them. At any rate, hangers-on rarely rise in these places to the dignity of a nuisance.—*Lippencott's Magazine.*

THE Bellefonte Car Works, at Bellefonte, Pa., are to be sold at auction, May 17, when purchasers will have an opportunity of acquiring valuable car-building machinery, tools, etc., at reasonable prices. Particulars will be found in our advertising columns.

THE *National Car-Builder Supplement*, for 1882, will be ready for delivery with our June number.

DURING 1881, the number of emigrants that arrived in the United States was 720,045, which is equal to six-tenths of the present population of New York City. This year the indications are that the foreign influx will be very much larger. If this movement is to continue year after year in an increasing ratio, "the asylum of the oppressed" will have to be enlarged.

NATIONAL CAR BUILDER

PUBLISHED MONTHLY
BY
R. M. VAN ARSDALE,
MORSE BUILDING.....NEW YORK.

JAMES GILLET, Editor.
L. E. WATERMAN, CORRESPONDING EDITOR.

MAY, 1882.

CONTENTS.

EDITORIAL ANNOUNCEMENTS.

Addresses.—*Business letters should be addressed, and drafts and money orders made payable, to* THE NATIONAL CAR-BUILDER. *Communications for the attention of the Editor should be addressed* EDITOR NATIONAL CAR-BUILDER.

Advertisements.—*Nothing will be inserted in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *The editorial department will contain our own views and opinions; and the rest of the reading matter, aside from advertisements, will be such as we consider of interest to our readers.*

Contributions.—*Articles relating to railway rolling stock construction and management, and kindred topics, by those who are practically acquainted with these subjects, are especially desired. Also early notice of changes in railroad officers, organizations and names of companies.*

Special Notice.—*As the* CAR-BUILDER *is printed and ready for mailing on the last day of the month, advertisements, correspondence, etc., intended for insertion, must be received not later than the 25th day of the month.*

SUBSCRIPTIONS *to the* CAR-BUILDER *will be received, and copies kept for sale, at the following places:*
A. WILLIAMS & CO., 283 *Washington St., Boston, Mass.*
L. SCHAFFNER, *Cigar and News Dealer, Grand Pacific Hotel, Chicago, Ill.*
WILLIE H. GRAY, 306 *Olive Street, St. Louis, Mo.*
ROBERT CLARKE & CO., 65 *West Fourth Street, Cincinnati, Ohio.*

Annual Conventions.

May 23—Railway Car Accountants' Association, at Boston, Mass.
June 13—Master Car-Builders' Association, at Philadelphia, Pa.
June 20—American Railway Master Mechanics' Association, at Niagara Falls, N. Y.

THE office of the NATIONAL CAR-BUILDER has been removed from 5 Dey street to the Morse Building, corner of Nassau and Beekman streets. Our proper address in future will be "Morse Building, New York, N. Y."

OWING to the pressing demand on our advertising pages we have been compelled to leave out the last page of our Directory of Railroads. We will try and not do so again.

IT is to be hoped that the circular recently issued by the Committee of the Car-Builders' Association in reference to a proposed change in the organization of that body will receive the attention it deserves from the managers and other officers of railroads to whom it is addressed. The necessity of adopting some means for increasing the efficiency of the organization has been very fully discussed at the last two annual meetings, the result of which is the proposition embodied in the circular, to amend the constitution of the association so as to provide for the admission of a new class of members, who shall be duly accredited to represent the interest of their respective roads. As at present constituted, the association is perhaps as efficient as it can be as a mere voluntary organization, with no representative authority, and with scarcely any recognition by the road companies. It has no power to carry its recommendations into effect; nor, indeed, would it have any, as an association, if the proposed change in its membership were consummated, and any considerable number of the railroad companies should send their representatives to the annual meeting to act and vote under the conditions named. But a more direct tie would be established between the association and the roads, and its influence would doubtless be correspondingly greater in securing the co-operation which is so indispensable in bringing about anything like uniformity in the running gear

and attachments of freight cars. Final action will in all probability be taken on the subject at the coming June meeting, the nature of which will depend very much on the responses that may be received to the circular in the meantime. Unless these shall be such as to virtually guarantee the sending of a representative member to the annual meetings from some of the prominent roads, the objects sought to be attained by the movement will be frustrated, at least for the present.

THIRTY-TON FREIGHT CARS.

The question of dead weight in respect to freight cars, which was so much discussed a few years ago, is in a fair way of being settled by an increase of their carrying capacity without a proportionate increase of weight. The old formula of ton for ton has become obsolete, and the tendency now is to build cars that will carry twice their own weight of paying load, and thus save the hauling of a vast amount of non-paying weight, and at the same time reduce the cost of construction and maintenance of cars by using a less number in proportion to the total tonnage.

This tendency is very strikingly shown in a circular we print elsewhere, and which has recently been sent out by a committee of the Car-Builders' Association, asking for certain specified information on the subject to aid them in making their report at the annual meeting in June. The tenor of the circular leaves no doubt as to the views of the committee. They believe in the superior economy of building box cars capable of carrying a load of 30 tons, and that the old limit of 10 tons was a wasteful and costly delusion. The more recent 20-ton limit of carrying capacity seems also to be a delusion which differs from its predecessor only in degree. That the committee are right in these views is apparent from the tabular statement which forms a part of the circular, showing the comparative economy of the three classes of cars of 10, 20 and 30 tons capacity, on the basis of transporting 1,000 tons of frieght. The points made in favor of cars of the latter class can not well be disputed, unless the figures can be shown to be erroneous, and we do not discover any flaw in them, except what may be considered by some as too low an estimate of the weight and cost of a 30-ton car. Assuming the statement to be substantially correct, it follows that the railroads have hitherto been all wrong in the way they have been carrying freight, and now that they are about to get on the right tack, there is nothing for the narrow 3-foot gauge roads to do but to widen their tracks as quickly as possible and put on heavy rolling stock. The cars and engines, of course, will have to be new ones, as the old toy equipment can not well be stretched to the new dimensions.

There is one consideration, however, which the committee have not touched upon in their circular, but which is of the utmost importance in the running of heavy cars with largely increased loads. We allude to the weight per wheel, which is really the only obstacle in the way of 50 or 60-ton cars, unless the number of wheels can be increased in proportion to the increase of load and weight of car-body—comparatively as the wheels of heavy freight locomotives are increased so as to distribute the weight and friction. Let us see how this matter stands as regards the 30-ton cars proposed by the committee. For the purpose of comparison, we will first take an old-fashioned 10-ton car with standard axles, and 3¼×7 journals. These axles and journals are not quite out of date, it is true, but they will be in less than twenty years.

10-TON CAR.

	Pounds.
Total weight of car	20,000
Less weight of wheels and axles	5,200
Weight on journals	14,800
Add load of 10 tons	20,000
Total weight on journals	34,800
Total weight on each journal	4,350
Weight per square inch of bearing surface	167

With a load of 15 tons, or 30,000 pounds instead of 20,000, the weight on each square inch of bearing surface would be 215 pounds.

30-TON CAR.

	Pounds.
Total weight of car	24,238
Less weight of wheels and axles	5,400
Weight on journals	18,838
Add load of 30 tons	60,000
Total weight on journals	78,838
Total weight on each journal	9,855
Weight per square inch of bearing surface	379

The weight of the 30-ton car is on the basis of 412 tons for 1,000 cars, as stated in the circular, but this we think is too little. The bearing surface for the size of journals is 26 inches, omitting fractions. It has been said that there is no reason why the journals of freight cars should not carry as much weight per square inch of bearing surface as the journals of locomotives. The weight on a single driving-wheel of an ordinary passenger engine is about 11,000 lbs., and with 6½ × 7½ journals, the weight per square inch of bearing surface is 230 lbs., or 149 lbs. less than the estimated weight for the 30-ton car. This is quite a difference, in view of the fact that the locomotive journal is very much larger, and distributes the weight over more surface. Some allowance might be made on account of the slower speed of freight as compared with passenger trains, were it not that the freight trains of the future, if they are to be made up of 30-ton cars running on separate tracks unincumbered by passenger traffic, are not expected to go creeping along at the rate of 12 miles an hour as they do now. The matter of bearing surface and weight can not be put aside in the 30-ton car movement, and it is probable that the committee will give it due attention in their forthcoming report.

The circular, as will be seen, anticipates the possible necessity of heavier axles and wheels than the present standards. One thing is certain. The axles and wheels are either too heavy for the work they are doing now, or not heavy enough for the work they are expected to do by and by. There will be no trouble, however on this score. "Bring on your 30-ton cars," said a prominent wheel-maker at the last annual meeting of the Car-Builders' Association, "we will try and be ready with the wheels."

FUTURE RAILROAD MILEAGE.

The State of Massachusetts has an average of one mile of railroad to four square miles of territory, and this is assumed by Mr. Edward Atkinson to be a standard of what is sufficient for a like density of population anywhere else. Should this proportion of railroad mileage be maintained until the rest of the country becomes as thickly settled as Massachusetts is to-day—a thing within the possibilities, if we may judge from present indications—a railroad map of the future will be suggestive of something more complex than a simple gridiron; and as for complete manuals, time tables and travelers' guides, the most industrious compiler must shrink from the task of their preparation. What the total mileage will be it is hardly worth while to conjecture, because when numbers reach a certain limit they cease to convey any very definite ideas of magnitude to the mind.

Whether the time will ever come when the country will be so overlaid with railroads as virtually to put a stop to new construction, it is needless to speculate; but that the construction will continue with little interruption so long as the needs of the population require it, is quite certain. In our extended territory there are vast areas in which the need will increase very slowly, and Mr. Atkinson, therefore, divides the States and Territories into five classes, according to his notion of the additional railroads they will require during the remaining 17 years of the present century. First, those that will require to come up to the Massachusetts standard; second, those that will want 1 mile of railroad to 8 square miles of territory; third, those that will need 1 in 16; fourth, 1 in 32; and fifth, 1 in 64. Upon this basis he finds that 117,447 miles of new road will be demanded before the year 1900, and that when this is built the proportion for the whole country will be only 1 mile of road to 15 square miles of area. This does not seem to be an extravagant calculation. It is, indeed, inside the mark rather than over, unless the new construction is to be retarded by war, or by financial revulsions of considerable duration and severity. During the past 16 years, from 1866 to 1881 inclusive, the average of new construction has been 4,125 miles a year, covering three years of panic and depression; and it can hardly be supposed that this average will not be considerably exceeded during the coming 17 years. The expenditure for the estimated new construction, on a basis of $35,000 per mile, will be over $200,000,000 a year, a sum which ought not to be a very serious tax upon the increasing wealth and productiveness of the land.

Aside from its effects upon the industrial prosperity of the country, there is another aspect to this matter which is attracting some attention. The anti-monopoly reformers are doubtless filled with dismay at the prospective doubling of our present railroad mileage. Vanderbilt and Gould, being mortal men like the rest of us, may not live to see it; but who can say that others more ambitious, grasping and powerful, may not rise up to fill their places, buy up courts and legislatures, undermine our political system, and allow nobody to ride or ship freight from one point to another without paying fares and rates vastly in excess of the "cost of service?" Every school-boy knows that eternal vigilance is the price of liberty, and we admonish the reformers not to forget it.

A NEW CAR AXLE LUBRICATOR

A great many plans have been tried for superseding the use of waste packing in the oil boxes of car trucks, and although many of them have worked well in an experimental way that seemed to promise the best results, they have for one reason or another been laid aside, and the old regulation "waste" method—*waste* in a double sense—adhered to in preference. The proposed substitutes have all been based upon the principle of feeding the lubricant upon the journal, either from a reservoir above it or from the cellar underneath—the former by gravity, and the latter by capillary attraction through the medium of wicking or a revolving wheel running in contact with the oil and journal. These methods can, of course, be almost infinitely varied, each supplying oil to the journal continuously, and in the requisite quantity without frequent attention or unnecessary waste. Just how many of this class of devices have figured in the CAR-BUILDER within the last ten years we will not undertake to say; but the number is considerable, to say nothing of those which have escaped our notice. The world is progressive, and there is no reason why oil-boxes should always blaze and burn, with nothing to season the fry and make the horrible odor less offensive to the nostrils of humanity.

One of the more recent attempts to corner the waste packing problem consists in feeding the oil to the journal by means of a concave roller, with a quantity of bristles stuck transversely through the center and dipping into the oil, the roller being held to the journal, with which it revolves, by a spiral spring underneath. The device is manufactured by the American Lubricating Co., of Philadelphia, under patents granted to W. G. Mitchell in 1880. To understand it clearly, a model or drawing would be necessary. The reported results of tests on a number of roads are quite remarkable. On a passenger car of a Florida road it was run 3,400 miles on two quarts of oil; on a Canada road it has run 40,000 miles, and is considered good for as many more; has saved 66 per cent. of oil over the old method on a Pullman car running on another Canada road; and has done similar service on a tender-truck of the Chesapeake & Ohio road, keeping the two journals cold to which it was attached, while the other six, which were lubricated on the regulation plan, got hot. It is claimed, indeed, that it will run 10,000 miles in 30 days on a pint of West Virginia oil to each journal. If this is so—and the statement is backed by pretty good authority—the matter is worth looking into. Every railroad man can figure up the saving for himself, as soon as he is sure of the facts.

LABOR STRIKES.

The philosophy of labor strikes ought to be better understood than it is, and more especially by the class of people who engage in strikes. In a business point of view the world is made up of buyers and sellers, and of necessity every individual person is compelled to act more or less in both capacities. We buy and sell merchandise, all kinds of products, skilled and unskilled labor, and sometimes bad people have been known to buy and sell fancy stocks, votes and lucrative offices. There is, and always will be, a mutual antagonism of interest between the parties to a bargain. If they can not agree about the terms there is no bargain. Labor is a marketable thing, the same as merchandise. If nobody will give what the owner asks for it there is no sale. This is the principle which governs all business transactions, and it can no more be abrogated or got rid of than we can escape from the influence of gravitation. Yet this is exactly what the promoters of trades' unions are trying to do; to take labor out of the category of salable things and make it an exception to the law of supply and demand. But as labor organizations exist on an extensive scale, it is probably better that they should be recognized by railway and manufacturing interests than altogether ignored. When not under the direction and management of self-seeking demagogues, they may be productive of some incidental benefit by cultivating a feeling of mutual regard, and a degree of sociability among the membership that would not otherwise exist; but at the same time they destroy freedom of action and judgment on the part of the workman, by virtually forbidding him to make his own contracts or to set up a claim to the ownership of his own labor. They also seek to bull the labor market regardless of the state of trade and financial exigencies, and maintain a high scale of prices against adverse influences beyond their control. There is no justice in this; and although a temporary rebellion may be incited against the inevitable in the form of a strike, the evil returns to the laborer in the end, and his last state is worse than the first. If it were possible to obtain accurate statistics showing the losses and gains both to employers and employed, resulting from labor strikes, the gains would probably disappear altogether. Labor, like capital, whether organized or lying about loose, must necessarily compete with itself, and any artificial device to prevent it is as futile as the attempt to lift one's self up by his boot straps.

CONTINUOUS BRAKES IN ENGLAND.

The use of continuous brakes on passenger trains makes slow progress in England. During the five years the subject has been before Parliament less than half the vehicles and engines of such trains have been provided with such brakes, and some of the brakes so returned very imperfectly fulfill their designation. A bill is now pending which makes it compulsory on all companies to have an efficient brake on all trains, but without specifying any particular brake. Its efficiency, however, must consist in its instantaneous action and application. In case of accident it must be automatic or self-acting; must be capable of being easily put on and taken off, and constructed of such materials as to be durable and easily repaired and kept in order. In a recent discussion in the House of Lords, on the second reading of the bill, objection was made to the self-acting principle as being liable to cause the brakes to "creep on" and bring trains to a stop when such stoppage was not desirable and even dangerous. The Earl of Aberdeen said that he had seen an express train on a down grade brought to a complete standstill by the self-acting process, and contrary to the wish of the engineer, thus introducing a new element of danger instead of safety. It was thought best, therefore, that the bill should be so modified as not to make the automatic action compulsory

unless it could be so regulated as to apply only in cases of accident.

It appears from this that the English law-makers are inclined to be cautious in imposing hard and fast rules for the government of railways in the matter of brakes. They evidently want all the advantages of the self-acting principle without any of its possible disadvantages. When a train parts by the breaking of a coupling, it is an accident, and the object of the automatic attachment is to apply the breaks and notify the engineer that something is wrong. But the attachment may sometimes apply itself when no stoppage is required, which would also be a notification that something is wrong. Instead of weighing one evil against the other and choosing the least, some people would dispense with the automatic arrangement altogether, and then with the brake itself, because it is not self-acting. The next step required to be taken by this method of reasoning, would be to abolish railroads and go back to horse vehicles, which need no brakes at all.

In this country the Westinghouse automatic brake is considered indispensable for fast and heavy trains, and although like all other mechanical contrivances it is liable to get out of order, it will not be abandoned until some more effective device is forthcoming to supply its place.

IF there should be a heavy grain crop this year, of which there is now a fair prospect, there will be a correspondingly heavy freight movement when the new crop begins to be thrown on the market. Whether there will be freight blockades and a car famine, of which there was so much complaint last summer, will depend of course upon the supply of cars. Because the current traffic now does not give employment to all the available freight equipment of the roads, it is thought by some that there are cars enough, and that if the shops keep on building them there will be an excess which will become burdensome. If the freight movement through the year was uniform, the roads might manage so as to have but few idle cars on hand at any time. The movement, however, is not uniform, but is subject to great fluctuations; and in order to command the traffic the roads must be stocked with cars to meet the rush when it comes. A heavy grain crop in the Northwest this year will find a waiting market at good prices, in consequence of the short supply of last year and the using up of the previous surplus. This will make things lively for the transportation lines, and bring every car into use for a time at least. The immense immigration of last year, with a still heavier influx from abroad this year, in connection with the natural growth of western population, will, of course, absorb a larger portion of agricultural products than heretofore; but at the same time this increase of population tends to increase the production very considerably. The car-building boom has doubtless receded a little from high water mark, but there is no fear of anything more serious unless the coming crop fails.

CORRECTION.—In our last issue, which contained illustrations of the Richmond & Alleghany R. R. Standard Coal Car, it was stated that the car was designed by George D. Harris, the Master Mechanic of the road. This, we are informed, is an error. The car was adopted, with some slight alterations, from cars of the same class previously in use on the Chesapeake & Ohio road.

IT is said that wood-work of any kind may be made incombustible by painting it with several coats of solution of silicate of soda, and finishing off with a mixture of this solution and sufficient common whiting to make it about as thick as ordinary paint. Wood treated in this way will not take fire from mere contact with flame; it requires to be heated until destructive distillation begins. Then, of course, gases are given out which ignite, and the wood is gradually converted into charcoal, but until such distillation takes place the coated wood will not support combustion.

THE H. B. Smith Machine Co. have enlarged their warerooms and store in Philadelphia, making them 200 feet deep, in order to accommodate their stock of wood-working machinery and machinists' tools.

THE Holt Manufacturing Co., of Cleveland, O., have taken the sale of their portable forges from the hands of dealers, and now sell directly to consumers. Forges that were formerly listed at $23 are now sold for $10.

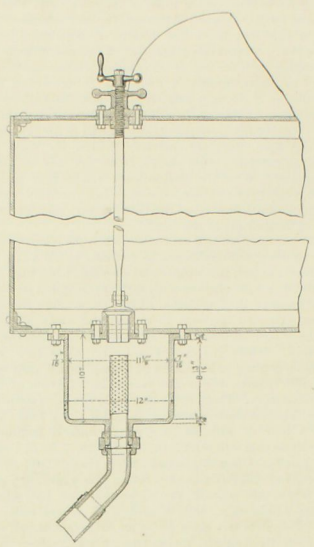
THE Niagara Refining Co., of Buffalo, is running full capacity on orders for the Backus Railway Oils and Car Greases. The Backus Palmetto Car Grease, made by this company, in a recent test on one of the large railroads centering at Buffalo, ran a car 2,000 miles with one greasing, the road having previously used oil for boxes that ran only 750 miles.

A COMMERCIAL traveler, who is something of a wag, thus relates his experience: He and his companion were the sole occupants of the smoking car. They tried to converse, but the road was so rough they were pitched from side to side like ship's passengers. At last they were able to make each other understood. One said, "Dan, the old thing is running smoother." To which Dan replies, "Yes, I guess she has got off the track."

A TEST was recently made by the Boston Standard Wheel Co. of the strength and tenacity of the rubber cushion of the Cooper steel wheel. The rubber, by the vulcanizing process, adhered so firmly to the steel tire and iron body of the wheel that a continuous pressure of from 90 to 100 tons against the iron depressed the body within the tire only ¼ of an inch, which depression was recovered on removing the pressure. When the wheel is ready for use, every part is equalized and normal, and is a complete unit, without bolts or plates to hold it together, and can not be broken by use. The wheels are said to be perfectly safe when the tires are worn to ¼ an inch in thickness, and that new tires can be put on and the wheels made as good as new for one-half the first cost.

Water-Chambers for Injectors.

The increasing popularity and more extensive use of injectors in place of pumps for supplying locomotives with water make any improvements which add to their efficiency a matter of interest. One of the inconveniences of the injector is its liability to lose its supply of water on account of the swash in the tender, especially when the water is low. In the CAR-BUILDER for February we gave working drawings of Mr. Joham's water-chamber for the prevention of leakage. Mr. Wilson, of the Chicago & Alton road, puts a reservoir 8 or 10 inches deep under the leg of the tender, as shown on page 32 of our March number. Mr. Cook, of the Georgia Railroad, uses a similar reservoir cast in the shape of a round-bottom kettle.



The engraving represents another method, devised by Wm. Sellers & Co., of Philadelphia, consisting of a supplementary water-chamber with strainer attached, and placed under the tank, designed to prevent swash, and the carrying of dirt and cinders into the injector so as to interfere with its working.

All these methods prevent the interruption of the water before the tender is empty, by holding a supply which can not be lifted from the feed-pipe by a jerk of the tender. These reservoirs also furnish a place for putting in larger strainers that will not clog up and shut off the water as readily as the smaller ones in the hose coupling.

Mr. Turrentine, at Company's Shops, of the North Carolina R. R., has improved the working of his injectors by putting a sheet-iron air-chamber on the feed-pipe, with a T connection just behind the rear driving wheel. It is funnel-shaped, about 15 inches high, and runs up from the size of the pipe to about 6 inches in diameter at the top.

THE laziest animal in the world, with one exception, is the Mexican mule. The one exception is the Mexican himself.

"WHAT is a junction, nurse?" asked a seven-years-old fairy the other day at a railway platform. "A junction, my dear," answered the nurse, with the air of a very superior person indeed, "why, it's a place where two roads separate."

THIRTY years is said to be the life of a locomotive. Possibly they would live longer if they did not smoke so much.—*Boston Commercial Bulletin.*

Evidently you are not much acquainted with the machine. Smoking don't shorten their lives. Its because they live so *fast.*

Our Directory.

We note the following changes since our last issue. Readers are requested to give us prompt notice of changes when they occur:

Central Ontario Railway.—This is the new name of the Prince Edward County Railway, authorized by the Legislature of Ontario, Canada.

Chicago, Burlington & Quincy.—George B. Harris has been appointed Purchasing Agent, vice William Irving. W. M. Shaw is general agent of the company at Cincinnati, O.

Chicago, Milwaukee & St. Paul.—John Bailie has been appointed Superintendent of the Car Department of the company, which is divided into six districts, the first or North Milwaukee district being in charge of W. E. Kittridge, and the others in charge of the respective shop foremen.

Chicago & Eastern Illinois.—Superintendent O. S. Lyford announces that D. R. Patterson has been appointed Purchasing Agent of this road, with office at Chicago.

Cincinnati, Hamilton & Dayton.—E. E. Dwight has resigned the position of Superintendent of the Dayton & Michigan Division.

Cleveland & Pittsburg.—W. F. Beardsley, formerly Master Mechanic of the Sunbury Shops of the Philadelphia & Erie, has been appointed Master Mechanic vice N. E. Chapman, who has gone to the Baltimore & Ohio.

Delaware, Lackawanna & Western.—The Purchasing Agency of this road has been divided, G. W. B. Cushing retaining charge of the purchase of general supplies. The purchase of lumber and oil has been made a separate department and placed in special charge of W. D. Hager as purchasing Agent, with office at No. 26 Exchange Place, New York City.

East Tennessee, Virginia & Georgia.—J. M. Edwards has resigned the position of Superintendent of the Macon & Brunswick Division.

Florida Central & Western.—This is the name of the new corporation formed by the consolidation of the Florida Central and Jacksonville, Pensacola & Mobile roads. Wm. M. Davidson is General Manager and John P. Laird Superintendent.

Great Western, of Canada.—Charles Stiff, late Superintendent, has been promoted to the position of Assistant Manager. Mr. John Burton succeeds Mr. Stiff as Superintendent; he was recently Assistant Manager of the Detroit, Grand Haven & Milwaukee.

Illinois Midland.—The United States Circuit Court has appointed D. H. Conklin Receiver, in place of L. Genis, removed. Mr. Conklin was recently connected with the Chicago, Pekin & Southwestern.

New York & New England.—George E. Boyden has resigned the position of Superintendent of Motive Power and Machinery.

Pennsylvania.—Robert E. Pettit has been appointed Superintendent of the New York Division, in place of Wm. McCrea, promoted to be General Manager of the Pittsburg, Cincinnati & St. Louis.

Pennsylvania Company.—Wm. A. Baldwin, now Manager, has been appointed General Manager of the company's lines, in place of D. W. Caldwell, resigned.

Pittsburg, Fort Wayne & Chicago.—G. W. Lowe, Master Mechanic in charge of the shops at Crestline, O., has resigned to accept a position on the Chicago & Northwestern.

Richmond & Danville.—J. P. Minetree has been appointed General Purchasing Agent.

St. Louis, Keokuk & Northwestern.—Wm. H. Bartlett has been appointed Master Mechanic in place of Wm. Foley, resigned.

THE ASHCROFT MANUFACTURING CO. are compiling a new catalogue of the specialties of their manufacture, to be illustrated with new cuts by the best designers and engravers. It will be the most complete manual of steam gauges and special appliances for steam boilers ever issued. The company's factories are at Boston and Lynn, Mass., and their office and salesrooms at 111 Liberty Street, New York.

Employment.

Advertisements will be inserted under this heading for one dollar for each insertion.

WANTED.—A position as Superintendent or Assistant Superintendent of Car Works, Master Car-Builder or General Foreman of a Railroad Car Department, or Inspector of Rolling Stock under construction. The applicant has had large experience in each of these capacities, and can furnish first-class references. Address "D.," Office of NATIONAL CAR-BUILDER.

FORGINGS.—A practical man having some capital to invest would like to hear from parties who are desirous of establishing the forging business. Address, stating location, chances for business, and inducements that can be offered, W. H. N. & Co., office of NATIONAL CAR-BUILDER, 5 Dey street, New York. 3t

CAR-BRAKE SHOE INFRINGEMENT.

Extract from specifications of original letters patent No. 217,996 dated July 29, 1879, issued to John F. Curtice, for an improvement in Car-Brake Shoes: "My invention is an improvement upon the Car-Brake shoe patented March 21, 1876, by I. H. Congdon."

Extracts from legal opinion given by West & Bond, of Chicago: "We have examined patent to Congdon, No. 174,898, also reissue 9,329, to John F. Curtice, also his original patent, No. 217,996. Question submitted is, does the device described and claimed by said reissue infringe the patent to Congdon? Congdon, as we understand it, was the first to provide a shoe for car-brakes composed of a cast-iron body, having pieces of some other metal embedded in its face, and the claim of his patent is for such a shoe. The patent is not limited to any special arrangement of the embedded pieces, and their form and size is not material. * * * The Curtice shoe is composed of a cast-iron body, having wrought iron embedded in its face, and hence it is substantially the same thing as the Congdon shoe. There is only a slight difference in construction between the Congdon and the Curtice shoe, and in this slight difference is found the foundation for the Curtice patent. It is manifest that the Curtice patent, the original of which is dated July 29, 1879, is for an improvement upon the Congdon shoe. This fact is squarely stated by the original patent. The reissue, in fact, admits prior existence of the Congdon. * * * It is proper to refer to an original patent in constructing a reissue, and Curtice, by omitting from the reissue the clause which states that his invention is an improvement on the shoe patented by Congdon, cannot escape the force of the admission. * * * Congdon having a claim which covers the invention is not limited to the exact mode of construction described, and is entitled to hold as an infringement a shoe substantially the same, and varying only in some detail of construction. * * * In our opinion, the carbrake shoe described and claimed in and by the Curtice reissue embodies the invention claimed by the Congdon patent, and is an infringement thereof. (Signed) WEST & BOND.

CHICAGO, Feb. 17, 1882.

Railroads now using or which may use the Congdon Brake Shoe, under the letters patent, will be protected by

THE CONGDON BRAKE-SHOE CO.,
Chicago., Ill.

CONTINUOUS DRAW-BAR PATENTS.

The following circular has been issued by the Secretary of the Western Railroad Association:

CHICAGO, Sept. 9, 1880.

To the Members of the Association:

GENTLEMEN:—Claims have been pending for several years that the Continuous Draw-Bar, sold by the Continuous Draw-Bar Company under the Middleton and the Griffith and Patterson patents, is an infringement of patent 71,580, granted 3d December, 1867 (re-issue No. 8,085, granted 19th February, 1878), to Edward L. Caum.

This Association has continuously advised against entertaining this claim, but to quiet all questions, and at our instigation, the Continuous Draw-Bar Company has recently purchased the Caum patent, its owner inserting in the assignment a full and absolute release to all the members of the Eastern and Western Railroad Associations from any and all liability for, or on account of, any infringement heretofore of said patent.

Yours truly,
J. H. RAYMOND, Secretary, etc.

CLARENCE BROOKS & CO.

MANUFACTURERS OF

RAILWAY CAR AND FINE COACH VARNISHES.

Cor. West and West 12th sts., New York.

JOHN W. MASURY & SON,

MAKERS OF STRICTLY FIRST-CLASS

Railway Varnishes,

AND MANUFACTURERS OF

CAR BODY COLORS.

By permission, we refer to the following Companies, for whom we have made Special Colors:

PENNSYLVANIA RAILROAD CO., Enoch Lewis, Purchasing Agent, Philadelphia, Pa.
PENNSYLVANIA CO., Wm. Mullins, General Purchasing Agent, Pittsburg, Pa.
BALTIMORE & OHIO RAILROAD CO., N. S. Hill, Purchasing Agent, Baltimore Md.
CHICAGO & ALTON RAILROAD CO., A. V. Hartwell, Purchasing Agent, Chicago, Ill.
CHICAGO & NORTHWESTERN RAILROAD CO., R. W. Hamer, Purchasing Agent, Chicago, Ill.
LEHIGH VALLEY RAILROAD CO., L. Chamberlin, Purchasing Agent, Philadelphia, Pa.
NORTHERN RAILROAD OF CANADA, F. W. Cumberland, Superintendent, Toronto, Ont.
NAUGATUCK RAILROAD CO., G. W. Beach, Superintendent, Waterbury, Conn.
PHILADELPHIA, WILMINGTON & BALTIMORE RAILROAD CO., S. A. Hodgman, Superintendent of Motive Power, Wilmington, Del.
NEW YORK, NEW HAVEN & HARTFORD RAILROAD CO., R. N. Dowd, Commissary, New Haven, Conn.
UNION PACIFIC RAILROAD CO., A. D. Clark, Purchasing Agent, Omaha, Neb.
KANSAS " " "
CHICAGO, BURLINGTON & QUINCY RAILROAD CO., Wm. Irving, Purchasing Agent Chicago, Ill.
LOUISVILLE, CINCINNATI & LEXINGTON RAILROAD CO., Wm. Mahl, Purchasing Agent, Louisville, Ky
GRAND TRUNK RAILWAY N. Wall, Port Huron, Mich.
LITTLE ROCK & FORT SMITH RAILROAD CO., T. Hartman, Purchasing Agent, Little Rock, Ark.
GILBERT & BUSH CO., Troy, N. Y.
WASON MANUFACTURING CO., Brightwood, Mass.
BILLMEYER & SMALL MANUFACTURING CO., York, Pa.
JACKSON & SHARP CO., Wilmington, Del.
BARNEY & SMITH MANUFACTURING CO., Dayton, O.
— Railroad Car Builders.

The advantages derived from the use of such Special Colors are many, a few of which are found below:
ABSOLUTE UNIFORMITY OF SHADE, DURABILITY, as we use perfectly pure materials. **SAVING OF MONEY,** because of small quantity required. **SAVING OF TIME,** in the putting on of the same. **SAVING OF LABOR AND MATERIAL,** as no extra amount of Varnish will be required to hide a sanded surface. **LARGER DEGREE OF CERTAINTY** that there will be an absence of cracked work, as our mixtures are all uniform, being done by weight only.
We make any desired shade, if only being necessary that purchasers furnish us with sample of color desired, stating the time they would like to have the paint dry in.
We shall be glad to furnish samples and give prices to any who may wish to avail themselves of the above advantages.
Very respectfully,

JOHN W. MASURY & SON, New York and Chicago.

Established 1856.

Shipman & Bolen, Manufacturers of fine Railway Varnishes,

No. 352 Mulberry St., Newark, New Jersey.

BILLINGS, TAYLOR & CO.,

Color Makers,

AND MANUFACTURERS OF

VARNISHES, JAPANS AND LIQUID OIL DRYERS,

CLEVELAND, OHIO.

THOS. R. SHARP,

CONSULTING AND INSPECTING ENGINEER,

115 BROADWAY, NEW YORK.

SPECIAL ATTENTION GIVEN TO THE

Examination of Railroad Properties and Accounts, detailed Reports prepared of their condition and future prospects,

And to the Preparation of Railroad Prospectuses, Maps, Plans and Estimates of Cost of Construction.

ALSO TO THE

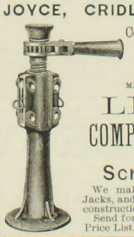
Construction of Railroads, the Purchase, Sale and Inspection of R. R. Material and Equipment.

Information promptly furnished on any and all subjects appertaining to the Organization, Construction Equipment and Operation of Railroads.

REFERENCES:

Hon. J. W. Gilbert, Brooklyn, N. Y.
Hon. H. J. Jewett, Pres. N. Y., L. E. & W. R. R., N. Y.
H. W. Ford, Pres. Nat'l Bank of Republic, N. Y.
R. T. Wilson & Co., Bankers, N. Y.
J. M. Crane, Cashier Nat'l Shoe & Leather Bank, N. Y.
Owens & Mercer, Bankers, N. Y.
W. B. Dinsmore, Pres't Adams Express Co., N. Y.
H. B. Plant, Pres't Savannah, Florida & Western R. R., and Southern Express Co., N. Y.
Gen. Thos. T. Eckert, V. Pres't W. U. Tel. Co., N. Y.
J. H. Devereux, Pres't C., C., C. & I. R. R., Cleveland.
John Newell, Gen'l Manager Lake Shore & M. S. R. R., Cleveland, O.
J. M. Toucey, Gen'l Sup't N. Y. C. & H. R. R. R., N. Y.
G. B. Roberts, Pres't Pennsylvania R. R., Phila., Pa.
A. J. Cassatt, Vice Pres't " " "
Frank Thompson, Gen. Man." " "
Thomas Cochran, Pres't Guarantee Trust and Safe Deposit Co., Philadelphia, Pa.
Robert Garrett, V. Pres't B. & O. R. R. Co., Baltimore.
John M. Robinson, Pres't Bay Line, Baltimore, Md.
Hon. John C. New, A. Sec'y Treasury, Washington.
James McCrea, Man. P. C. & St. L. Ry., Columbus.
W. C. Quincy, Gen'l Man., P. & L. E. R. R., Pittsburgh.
W. W. Peabody, Sup't. O. & M. R. R., Cincinnati.

JOYCE, CRIDLAND & CO.,



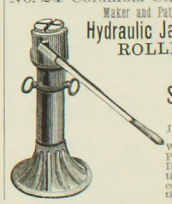
Cor. Wyandotte St. and Railroad,
DAYTON, O.,
MANUFACTURERS OF

LEVER,
COMPOUND LEVER,
AND
Screw Jacks.

We make 27 varieties of these Jacks, and have more in process of construction.
Send for Illustrated Catalogue and Price List.

RICHARD DUDGEON,

No. 24 Columbia St., New York.



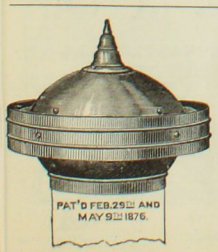
Maker and Patentee of IMPROVED
Hydraulic Jacks, Punches
ROLLER-TUBE EXPANDERS,
AND
DIRECT ACTING
Steam Hammers.

JACKS FOR PRESSING ON CAR-WHEELS OR CRANK PINS MADE TO ORDER. Communications by letter will receive prompt attention.

THE NATIONAL CAR-BUILDER SUPPLEMENT,

For 1882,

Will be ready for delivery with our June number.



SIMPLE, DURABLE AND CHEAP.

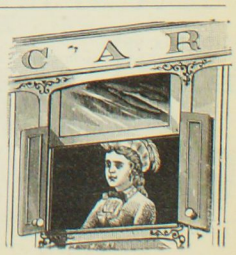
GLOBE
VENTILATORS,

For Ventilation of
Cars, Depots, Round-Houses
AND
WATER CLOSETS.
Twenty-five Sizes, from 2 in. to 48 in. inclusive.

GLOBE DEFLECTORS,

FOR

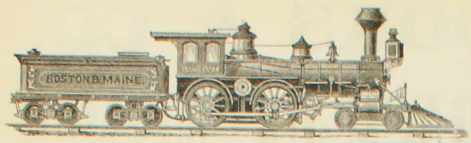
PREVENTING DUST OR CINDERS FROM ENTERING CARS.



MANUFACTURED BY THE

GLOBE VENTILATOR COMP'Y,
203 River Street, - - - - TROY, N. Y.

Catalogue and Price-List Furnished on Application.



MANCHESTER LOCOMOTIVE WORKS,

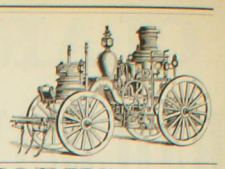
MANUFACTURERS OF

LOCOMOTIVES,

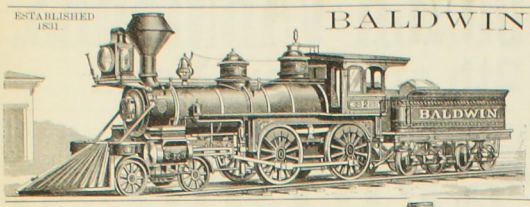
AND THE

AMOSKEAG STEAM FIRE-ENGINE.

JOHN A. BURNHAM, President. WM. G. MEANS, Treas., Boston, Mass.
ARETAS BLOOD, Agent, Manchester, N. H.



ESTABLISHED 1831.



BALDWIN LOCOMOTIVE WORKS,

PHILADELPHIA, PA.

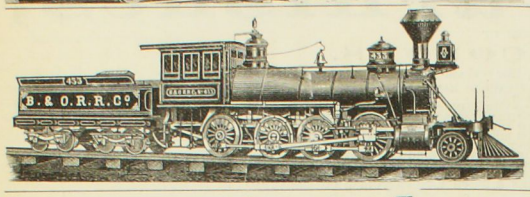
BURNHAM, PARRY, WILLIAMS & CO., PROPRIETORS,

GEO. BURNHAM, CHAS. T. PARRY, EDWARD H. WILLIAMS, } MANUFACTURERS OF { WM. P. HENSZEY, EDW. LONGSTRETH, JOHN H. CONVERSE.

LOCOMOTIVE ENGINES, { CAPACITY 600.

Adapted to every variety of service, and built accurately to standard gauges and templates. Like parts of different engines of same class perfectly interchangeable.

Passenger and Freight Locomotives, Mine Locomotives, Narrow Gauge Locomotives, Steam Street Cars, etc. Illustrated Catalogues furnished on application of customers. All work thoroughly guaranteed.



DANFORTH

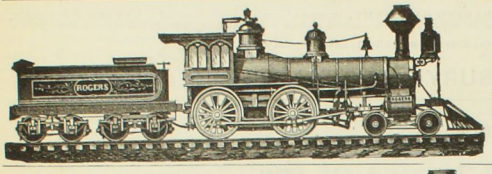
LOCOMOTIVE AND MACHINE COMPANY,

PATERSON, N. J.

NEW YORK OFFICE, - - 115 BROADWAY.

H. A. ALLEN, AGENT.

JOHN COOKE, President. J. T. BLAUVELT, Vice-Pres. } PATERSON, N. J. { WM. BERDAN, Sec. & Treas. JAMES COOKE, Supt.



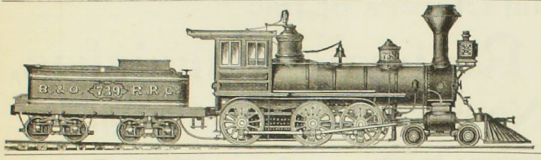
ROGERS LOCOMOTIVE AND MACHINE WORKS,

PATERSON, N. J.

New York Office, 44 Exchange Place.

Manufacturers of Locomotive Engines and Tenders and other Railroad Machinery.

J. S. ROGERS, President. R. S. HUGHES, Secretary. WM. S. HUDSON, Sup't. } PATERSON, N. J. R. S. HUGHES, Treas., 44 Exchange Place, New York.



PITTSBURGH LOCOMOTIVE AND CAR WORKS

PITTSBURGH, PA.,

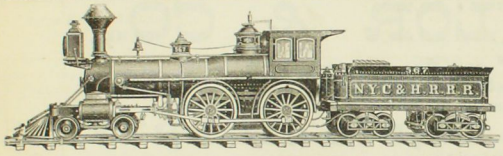
MANUFACTURERS OF

Locomotive Engines for Broad or Narrow Gauge Roads,

From standard designs, or according to specifications, to suit purchasers.

Tanks, Locomotive or Stationary Boilers Furnished at Short Notice.

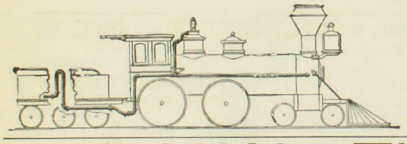
D. A. Stewart, Prest. D. A. Wightman, Supt. Wilson Miller, Sec. & Treas.



SCHENECTADY LOCOMOTIVE WORKS.

CHAS. G. ELLIS, President. EDWARD ELLIS, Treasurer.
WALTER McQUEEN, Vice-President.

SCHENECTADY, N. Y.



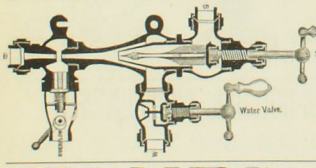
THE ASHTON VALVE COMPANY,

271 Franklin Street, Boston, Mass.

The Ashton Blow-back Safety-valve is constructed so as to conduct the escape steam which is blown off back to the tender, or to the smoke box and up the chimney. By this arrangement the heat of the escape steam, instead of being wasted as it is when an ordinary safety valve blows off, is communicated to the cold water in the tender. This not only results in an important economy, but it renders the escaping steam noiseless, and the increase of temperature of the water has a tendency to deposit some of its impurities before it is pumped into the boiler. It thus *stops the noise ! saves fuel ! and all engines steam better and faster, and do more effective work with these valves* than with those in ordinary use.

NATIONAL TUBE WORKS COMPANY,

BOSTON, MASS., and McKEESPORT, PENN.



Wrought-Iron Pipe and Tubes all sizes.

TRADE LOCOMOTIVE MARK.

Special Semi-Steel Tubes for Locomotives, Extra Heavy and Double Durability.

MACK'S PATENT INJECTOR.

New York Office, 104 John Street. Chicago Office, 159 Lake Street.

EAMES VACUUM BRAKE CO.,

RAILWAY TRAIN BRAKES,

P. O. Box 2878. SALES OFFICE, 15 GOLD ST., NEW YORK. Represented by THOMAS PROSSER & SON.

THE EAMES VACUUM BRAKE is confidently offered as the most efficient, simple, durable, and cheapest power Brake in the market. Can be seen in operation upon over seventy roads.

HALE & KILBURN MANUFACTURING COMP'Y

48 AND 50 NORTH SIXTH STREET, PHILADELPHIA, PA.,

ELASTIC SLAT SEAT.

REFERENCES.

N. Y. C. & H. R. R. CO.
N. Y. ELEVATED R. R.
ILL. CENTRAL R. R.
PULLMAN P. C. CO.
PENN. R. R. CO.
N. Y. & N. ENG'D R. R.
BALT. & O. R. R.
AND ONE HUNDRED OTHERS.

RATTAN SPRING SEAT.

EXTENSIVE MAKERS OF

PATENTED CAR SEATS AND SPRINGS.

SPRING EDGE SEAT.

ESTIMATES, CIRCULARS AND SAMPLES FURNISHED ON APPLICATION.

PARLOR CAR CHAIR

BACKUS
DARK LOCOMOTIVE
OIL,
BEING 24° SPECIFIC GRAVITY, IS AS THICK AND HEAVY AS CASTOR OIL, AND IS JUST THE OIL FOR A LOCOMOTIVE, OR ANY PLACE WHERE AN
Extraordinary Heavy Oil is Needed.

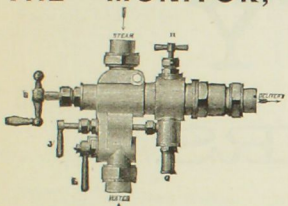
NIAGARA
REFINING CO. H. M. BACKUS GEN'L MANAGER.
H. M. BACKUS, Gen. Manager. F. B. HOWER, Supt. Sales Dept. D. H. WILSON, Treas.

BACKUS
PALMETTO
CAR GREASE,
IS NOT AFFECTED BY CLIMATIC CHANGES. IT OVERCOMES FRICTION, PREVENTS HOT BOXES, AND IS A PERFECT LUBRICATOR.
No Oil is needed in its use.
BUFFALO, N. Y.

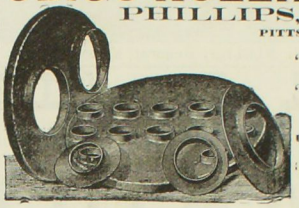
A. A. THOMSON & CO.,
IMPORTERS AND DEALERS IN
Genuine Russia Sheet Iron.
THE BEST FOR LOCOMOTIVE JACKETS.
Tin and Roofing Plates especially adapted for Railroad Car Roofs, Pig Tin, Zinc, Solder, Lead, etc.
Nos. 213 and 215 WATER STREET, NEW YORK.

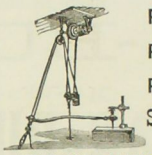
STEWART & LAWSON,
186 West Second Street, Cincinnati, O.
RAILROAD SUPPLIES, CONTRACTORS' SUPPLIES,
MACHINISTS' SUPPLIES, AND STEEL.
Polished Compressed Steel Shafting and Piston Rods.

WM. SELLERS & CO., PHILADELPHIA,
MANUFACTURERS
MACHINE TOOLS AND TWEDDLE'S HYDRAULIC RIVETER.
THE 1876 INJECTOR BOILER-FEEDER,
SIMPLE, RELIABLE AND EFFECTIVE.
Started, Regulated and Stopped by one Motion of a Lever.
Branch Office, 79 Liberty Street, NEW YORK.

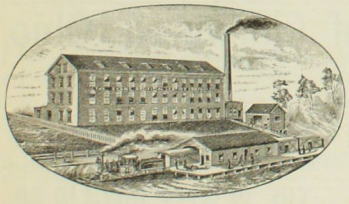
THE "MONITOR," FRIEDMANN'S PATENT

Locomotive Injectors
LIFTING & NON-LIFTING
With all Latest Improvements.
EJECTORS, OILERS, LUBRICATORS, &c.
A NEW LIFTING INJECTOR FOR LOCOMOTIVES. Send for Descriptive Circular.
NATHAN & DREYFUS, NEW YORK.

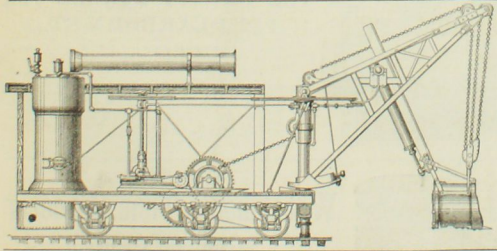
JAMES W. ROSS,
IMPORTER OF AND FURNACE AGENT FOR
SCOTCH and AMERICAN PIG IRON
MANUFACTURERS' AGENT OF
Bar Iron, Car Wheels, Axles, Rails and Railroad Supplies.
SALES AGENT
WHITAKER IRON CO., of Wheeling, W. Va.,
Manufacturers of Sheet-Iron, Tank, and Fire Bed.
36 Dearborn Street, - - - - CHICAGO.

SLIGO ROLLING MILLS.
PHILLIPS, NIMICK & CO.,
PITTSBURGH, PA.,
MANUFACTURERS OF

"Sligo" Boiler Plate and Fire-Box Iron.
"Sligo" Bar, Band, Sheet and Angle Iron.
"Sligo" Stay Bolt Iron,
Used by the Principal Railroads in the United States, and Warranted Unexcelled.
"TYRONE" BRAND BAR SHEET, TANK PLATE and ANGLE IRON.
Quality our Specialty.
BOILER HEADS AND FLUE HOLES FLANGED TO ORDER.
SEND FOR PRICE-LIST.


PORTABLE Machines for Use by Bridge, Engine and Boiler Makers.
PORTABLE Drilling, Tapping, Boring, and Reaming Machines
PORTABLE Machines for Wood Boring, Polishing, and Emery Wheel Grinding.
STOW FLEXIBLE SHAFT Co., Limited,
1505-1509 PENNSYLVANIA AVENUE,
PHILADELPHIA, - - PA.

EWING, MITCHELL & CO.,
RAILWAY, MILL, MINE AND MACHINISTS' SUPPLIES AND TOOLS,
No. 137 FIRST AVENUE, PITTSBURGH, PA.

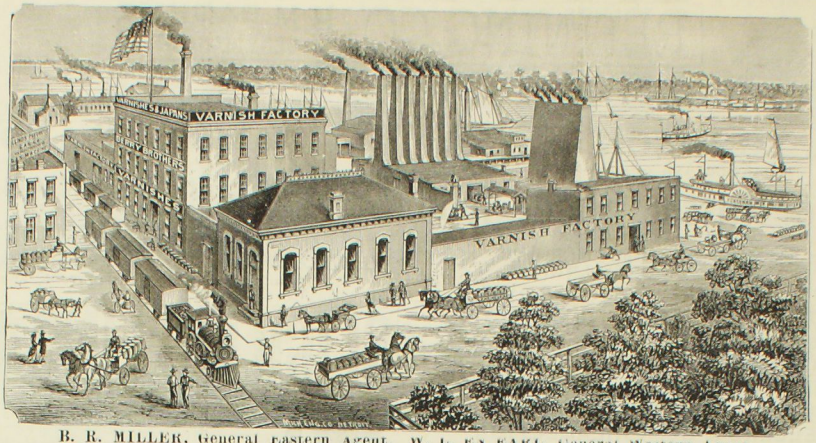
ECONOMY AND BEAUTY COMBINED IN THE
EVANS ARTIFCIAL LEATHER.

The attention of MASTER CAR-BUILDERS and PURCHASING AGENTS is specially called to these goods for upholstering Railroad Cars, and for panel and ceiling decorations for the finest palace cars.
This is the only substitute for UPPER LEATHER in the world that has PROVED SATISFACTORY OR PRACTICAL, and that cannot be distinguished from leather. Being very handsome and durable, not affected by heat or cold, and impervious to oil or water, it is for many purposes superior to leather, and costs from 33 to 50 per cent. less. It is manufactured in various weights and in every desirable shade of color, including also gold, silver and bronze. It comes in rolls of 30 and 50 yards, and 36 and 50 inches in width. A corporation has recently been organized under the laws of New Hampshire—where the factory is located—for the manufacture of this Artificial Leather, under various letters patent granted by the United States. A full assortment of the above most desirable goods can be found and articles made from it shown, at office and salesrooms, 92 Pearl street, corner of High street, Boston, Mass. Send for price list to the
Evans Artificial Leather Company.
GEORGE A. ALDEN, President. H. S. CHASE, Treasurer. WALTER N. DOLE, General Agent.


DILL'S IMPROVED IRON RAILROAD
STEAM SHOVEL & DERRICK CAR,
PATENTED 1880 AND 1881,
for loading ballast, moving heavy weights and clearing wrecks. Will do more work with less labor than any other Excavator. Crane and dipper operated by direct steam. Expense of chain and gearing avoided. The dipper is easily detached, leaving the machine a most simple, strong and effective derrick. Self-propelling on standard gauge; requires only 15 feet head room; will lift 18 feet and swing 20 feet from centre of track. Weight about 30 tons. We have standard sizes on hand, and make any special sizes to order.
INDUSTRIAL WORKS.
C. R. WELLS, Secretary, Bay City, Mich.; or
McMANN & RUSSELL, 58 Gold Street, New York

TRADE  MARKS:
PHOSPHOR-BRONZE
FOR BEARINGS OF LOCOMOTIVES, CARS AND MACHINERY
SLIDE VALVES, CYLINDER RINGS AND STEAM CONNECTIONS.
SAVES OIL AND REPAIRS, PREVENTS DELAY TO TRAINS, AND NEVER CUTS THE JOURNALS.
Pamphlets and particulars on application to
"Phosphor-Bronze." "THE PHOSPHOR-BRONZE SMELTING CO., Limited,
Office, 512 Arch Street, Philadelphia, Pa.
Owners of the United States Phosphor-Bronze Patents. Sole Manufacturers of Phosphor-Bronze in the United States.

BERRY BROTHERS, DETROIT, MICH., MANUFACTURERS OF RAILWAY VARNISHES.

ESTABLISHED IN 1858. USE BERRY BROTHERS' RAILWAY VARNISHES.



Frontage on Wight Street, 318 ft. Frontage on Lieb Street, 200 ft.

ESTABLISHED IN 1858. USE BERRY BROTHERS' RAILWAY VARNISHES.

B. R. MILLER, General Eastern Agent. W. L. EN EARL, General Western Agent.

THE E. D. ALBRO COMPANY,

DIRECT IMPORTERS OF

MAHOGANY

(Via New Orleans),

MANUFACTURED TO SIZES SPECIALLY ADAPTED FOR

CAR-BUILDERS.

MANUFACTURERS OF

VENEERS, CAR-BUILDERS' MATERIAL

FROM DOMESTIC AND FOREIGN WOODS.

685--711 West 6th St., **CINCINNATI, O.**

Estimates and Price Lists Furnished.

THE CONTINUOUS DRAW-BAR CO., of Cincinnati, Ohio,

Will sell Railroad Rights for their valuable Continuous Draw-Bars for Passenger and Freight Cars, which are now so rapidly superseding the old drawing attachments. We have purchased and now control the following patents: Allen Middleton, Phila., 2 patents; Griffith & Patterson, Cincinnati, Ohio; J. Caum, Phila.; and D. Holt, Albany, N. Y. Upward of 30,000 cars, including those of the leading trunk lines of the country, have already been equipped with these draw-bars, and they are every day becoming more popular. Their application saves railroad companies from 20 to 40 per cent. in first cost, and not less than 50 per cent. in daily running repairs. For particulars address

THE CONTINUOUS DRAW-BAR COMPANY,
945 RIDGE AVENUE, PHILADELPHIA.

ALLEN MIDDLETON, President; JOHN B. QUIRK, Secretary and Treasurer.
J. T. LEIGHTON, General Eastern and Southern Agent, New Haven, Conn.
SAMUEL GRIFFITH, General Western and Southwestern Agent, 142 Dearborn Street, Chicago.

WHITE LEAD.

JEWETT & SONS PERFECTION PURE WHITE LEAD TRADE MARK

We have made but ONE QUALITY of WHITE LEAD for the last twenty-three years. It is ground in Calcutta seed oil, and warranted perfectly pure

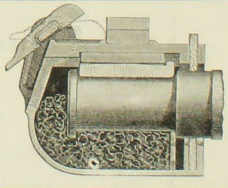
LINSEED OIL.

JEWETT'S PERFECTLY PURE LINSEED OIL RAW, BOILED & REFINED

All Linseed Oil bearing the above brand delivered by us is of OUR OWN MANUFACTURE, and guaranteed absolutely pure. Our BOILED OIL will be, as heretofore, POSITIVELY BOILED.

JOHN JEWETT & SONS,

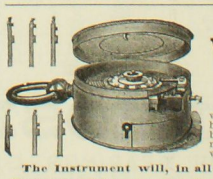
181 FRONT STREET, NEW YORK.



THE HEWITT BOX-LID CO.,

142 DEARBORN ST.,
CHICAGO, ILL.

We respectfully refer you to the following railroads using the Hewitt Cover:
K. C., St. J. & C. B.; M. R., Ft. S. & G.; C., R. & Q.; C., A. & St. L.; A., T. & S. F.; A. & N., K. P.; P. & P. M.; D., L. & N.; D. & B. C.; M. C.; H. & St. J.; C. & V.; St. L., I. M. & S.; R. & M.; R. (in Neb.); D. P.; L. L. & G.; L. E. & W.; L. P. & C.; I. C.; O. C.; St. L., V. & T. H.; St. P. & S. C.; N. P.; C. & E. I.; M. P.



BUERK'S

Watchman's Time Detector

Important for all Large Corporations and Manufacturing Concerns.

Capable of controlling with the utmost accuracy the motion of a watchman or patrolman as the same reaches different stations of his beat. The instrument is complete in itself, portable and as reliable as the best lever watch. It requires no fixture or wires communicating from room to room, as is the case with ordinary watch clocks.

The Instrument will, in all Cases, be Warranted Perfect and Satisfactory

The appeal of Imhaeuser against the decision of the Circuit Court of the United States, Southern District of New York, for infringing on my patent, was decided against him, at the last term of the Supreme Court of the United States, at Washington, D. C.

J. E. Buerk, Proprietor, No. 230 Washington Street, Boston.

P. O. BOX 979. In sending for circular or ordering the above please mention this paper

DIRECTORY

of the Railroads of the United States and Canada, showing the gauge, length of road, number of locomotives and number of cars; and giving the names and titles of their principal officers in charge of the operating, purchasing and rolling stock departments.

A

Adirondack R. R. 4-8½ gauge 62 m. 3 lo. 62 cars.
C. E. Durkee, *Supt* .... Saratoga, N. Y.
Jacob Myers, *M. M* .... Saratoga, N. Y.
Jas. J. Travers, *M. C. B* .... Saratoga, N. Y.
Alabama Great So'n R. R. (*See Cin., N. O. & T. P.*)
Albany & Susquehanna R. R. (*See D. & H. Canal Co.*)
Albert Ry. 4-8½ g. 51 m. 3 lo. 32 cars.
G. A. Robinson, *Manager* .... Hillsboro, N. B.
Jas. McKay, *M. M. & C. B* ...... Hillsboro, N. B.
Allegany Central R. R. 3 gauge 30 miles.
Geo. D. Chapman, *Gen. Man*...Angelica, N. Y.
W. O. Chapman, *Gen. Supt*...Friendship, N. Y.
Allegheny Valley R. R. 4-9 g. 259 m. 75 lo. 1968 c.
David McCargo, *Gen. Supt. & Pur. Agt.*; and
C. B. Price, *Supt.* (Riv. Div.)..... Pittsburg, Pa.
A. A. Jackson, *Supt.* (L. G. Div.). Brookville, Pa.
Geo. W. Glass, *M. M* .... Verona, Pa.
R. Gunning, *M. C. B* .... Verona, Pa.
Alliance & Lake Erie R. R. 3 g. 30 m. 3 lo. 112 cars.
W. E. Lewis, *Gen. Man* .... Alliance, O.
C. C. Dorman, *M. M. & M. C. B*.... Alliance, O.
Anderson, Leb. & St. L. R. R. 4-9 g. 19 m. 2 lo. 20 c.
J. A. Larnerd, *Rec. & Supt* ...Anderson, Ind.
Annapolis & Elk Ridge R. R. 4-8½ g. 20 m. 4 lo. 29 c.
W. H. Bians, *Supt. & Pur. Agt*. Annapolis, Md.
John L. Beall, *M. Mach* .... Annapolis, Md.
Arkansas Midland R. R. 3-6 g. 48 m. 4 lo. 45 cars.
A. H. Johnson, *Pr. & Gen. Man*...Helena, Ark.
J. B. Johnson, *M. M. & M. C. B*... Helena, Ark.
Ashland Coal & Iron Ry. 4-8½ g. 14 m. 2 lo. 122 c.
Douglas Putnam, Jr., *Gen. Supt*.. Ashland, Ky.
Robt. Peebles, *Pur. Agt* .... Ashland, Ky.
E. M. Roberts, *M. M* .... Ashland, Ky.
Ashtabula & Pittsburgh Ry. (*See Penna. Co.*)
Asheville & Spartanburg R. R. 5 g. 49 m. 2 lo. 12 c.
Jas. Anderson, *Supt. & Pur. Agt*. Spart'b'g, S.C.
Wm. Platt, *M. M* .... Spartanburg, S. C.
W. B. Brown, *M. C. B* .... Spartanburg, S. C.
Atchison, Topeka & Santa Fé R. R.
4-8½ g. 1,846 m. 203 lo. 8,108 cars.
C. C. Wheeler, *Gen. Man* .... Topeka, Kan.
D. J. Chase, *Gen. Supt* .... Topeka, Kan.
W. S. Mellen, *Asst. Gen. Supt*.... Topeka, Kan.
F. M. Smith, *Pur. Agt* .... Topeka, Kan.
Geo. Hackney, *Supt. Lo. & Car. Dept* do.
Clem. Hackney, *M. M* .... Topeka, Kan.
Eastern Div.: C. M. Rathbun, *Supt*.. Topeka, Kan
Henry Hull, *G. F. Car Dept*..... Topeka, Kan.
John Fagan, *M. M* .... Atchison, Kan.
J. M. Smith, *M. M* .... Kansas City, Mo.
W. W. Wheeler, *M. M* .... Emporia, Kan.
Mid. Div.: H. R. Nickerson, *Supt*. Nickerson, Kan.
W. Y. Johnson, *M. M* .... Nickerson, Kan.
J. Q. Adams, *M. M* .... Dodge, Kan.
Col. Div.: W. W. Borst, *Supt* .... La Junta, Col.
A. C. Stiles, *M. M* .... La Junta, Col.
H. W. Somers, *M. M* .... Raton, N. M.
Las Vegas D.: T. J. Seeley, *Supt*. Las Vegas, N.M.
L. H. Waugh, *M. M* .... Las Vegas, N. M.
Rio G. Div.: F. Leach, Jr., *Supt*. San Marcial, N.M.
M. C. Wheeler, *M. M* .... Wallace, N. M.
T. Clyde, *M. M* .... San Marcial, N. M.
H. P. Olcott, *M. M* .... Deming, N. M.
Atlanta & West Point R. R. (*See Western of Ala.*)
Atlantic & Pacific R. R. 4-8½ g. 286 m.
F. W. Smith *Gen. Supt*..... Albuquerque, N. M.
B. W. Angell, *Div. Supt*.... Albuquerque, N. M.
Geo. Chalender, *Supt. M. P. & M*.. do.
D. B. Sibley, *Pur. Agt* .... Chicago, Ill.
Augusta & Knoxville R. R. 30 miles.
A. J. Twiggs, *Gen. Supt & M. M*.. Augusta, Ga.

B

Baltimore & Ohio R. R.
4-8½ g. 1,539 m. 546 lo. 14,862 cars.
N. S. Hill, *Pur. Agt* .... Baltimore, Md.
E. Ohio Riv. Div. 4-8½ g. 972 m.
W. M. Clements, *Mast. Trans*... Baltimore, Md.
N. E. Chapman, *Mast. of Mach*.. Baltimore, Md.
A. J. Cromwell, *Asst. M. of M* .. Baltimore, Md.
L. Packard, *M. C. B* .... Baltimore, Md.
I. N. Kalbaugh, *M. M* .... Baltimore, Md.
Wm. Edwards, *M. M* ...... Martinsburgh, Va.
Sam. Houston, *M. M* .... Piedmont, Va.
Robert Maxwell, *M. M* .... Cumberland, Va.
S. B. Crawford, *M. M* .... Grafton, W. Va.
Alex. Laird, *M. M* .... Parkersburg, W. Va.
Chas. Hirsch, *M. M* .... Wheeling, W. Va.
Pitts. Div.: T. M. King, *Gen. Supt*... Pittsburg, Pa
J. E. Sampsell, *M. of Mach* .. Connelsville, Pa.
Trans-Ohio Divs.: B. Dunham, *G. Man* . Newark, O.
W. H. Harrison, *Mast. of Mach* ..... Newark, O.
E. L. Weisgerber, *M. M* .... Newark, O.
H. M. Ingler, *M. M* .... Bellaire, O.
O. B. Perkins, *M. M* .... Zanesville, O.
Andrew Beckert, *M. M* .... Sandusky, O.
F. J. Gunther, *M. M* .... Chicago Junction, O.
Chi. Div.: John Thomas, *Supt* .... Chicago, Ill.
Benj. Lowther, *M. M* .... Garrett, Ind.
W. H. Wilkinson, *M. M* .... Kingston, Ill.
Baltimore & Potomac R. R. (*See Penna. R. R.*)
Bangor & Piscataquis R. R. 4-8½ g. 63 m. 4 lo. 87 cars.
Arthur Brown, *Supt* .... Bangor, Me.
C. S. Nason, *M. M* .... Bangor, Me.
J. W. Comins, *M. C. B* .... Oldtown, Me.
Barclay R. R. 4-8½ g. 16 miles.
F. F. Lyon, *Supt* .... Barclay, Pa.
J. A. Hardenburg, *Pur. Agt*..21 Cort. st., N. Y.
Wm. Johnson, *M. M* .... Towanda, Pa.
Bath & Hammondsport R. R. 3 g. 9 m. 1 lo. 15 cars.
M. H. Hall, *Supt* .... Hammondsport, N. Y.
Allen Wood, *M. M* ...... Hammondsport, N. Y.
Battle Mountain & Lewis Ry. 3 gauge 11 miles.
L. B. Ball, *Supt. & Pur. Agt* .... Lewis, Nev.
Bedford, Springville, Owensburg & Bloomfield Ry.
3 g. 41 m. 5 lo. 65 cars.
Jas. W. Kennedy, *Gen. Supt. & Pur. Agt.*; and
Capt. Geo. Elliott, *M. M* .... Bedford, Ind.
Richard G. Elliott, *M. C. B* .... Bedford, Ind.
Bellaire & South-Western Ry. Co. 3 g. 42 m. 3 lo. 29 c.
S. J. Cochren, *Gen. Man* .... Bellaire, O.
Bell's Gap R. R. 3 g. 23 m. 2 lo. 35 cars.
R. G. Ford, *Supt* .... Bellwood (P. O.), Pa.
A. Zimmerman, *M. C. B* .... Bellwood, Pa.
Belt R. R. 4-8½ g. 12 m. 10 lo.
M. A. Downing, *Gen. Man* ... Indianapolis, Ind.
Bennington & Rutland Ry. 4-8½ g. 9 m. 10 lo. 214 c.
F. C. White, *Supt. & Pur. Agt*.. Bennington, Vt.
G. W. Blanchard, *M. M* .... Rutland, Vt.
Bodie Lumber Co 3 g. 34 miles.
Thomas Holt, *Supt. & Pur. Agt* ..... Bodie, Cal
E. M. Luckett, *M. M. & C. B* .... Bodie, Cal
Boston, Barre & Gardner. 4-8½ g. 36 m. 7 lo. 107 c.
H. M. Witter, *Supt. & Pur. Agt*. Worcester, Mass.
Chas. F. Brigham, *M. M* ...... Worcester, Mass.
Boston, Concord, Montreal & White Mts. R. R.
4-8½ g. 167 m. 34 lo. 677 cars.
James A. Dodge, *Gen. Man* ... Plymouth, N. H.
J. Thos. Vose, *Pur. Agt* .... Boston, Mass.
R. Adams, *M. M* .... Lake Village, N. H.
G. A. Ferguson, *Asst. M. M*.. Lake Village, N. H.
L. D. Pickering, *M. C. B* .... Lake Village, N. H.
Boston, Hoosac Tunnel & W'n Ry.
4-8½ g. 53 m. 17 lo. 1,112 cars.
W. L. Burt, *Pres. & Gen. Man*.... Boston, Mass.
J. L. Wellington, *Gen. Supt*. Mechanicville, N. Y.
J. L. Wellington, *P. A*..... Mechanicville, N. Y.
W. H. Powell, Jr., *M. M*.... Mechanicville, N. Y.
John S. Ellis, *M. C. B* ...... Mechanicville, N. Y.
Boston, Lowell & Concord R. Rs.
4-8½ g. 360 m. 110 lo. 2,211 cars.
H. C. Sherburne, *Gen. Man* ...... Boston, Mass
F. H. Nourse, *Pur. Agt* .... Boston, Mass.
Jas. T. Gordon, *M. M* .... Concord, N. H.
J. N. Lauder, *Supt. Roll. Stock* . Concord, N.H.
Boston & Lowell Div.:
J. F. Crockett, *M. Trans* .... Boston, Mass.
Concord Divs.:
H. E. Chamberlain, *Supt*... . Concord, N. H.
J. T. Gordon, *M. M. & C. B*. . Concord, N. H.

Boston, Revere Beach & Lynn R. R. 3 g. 9 m. 5 lo. 40 c.
E. H. Whorf, *Supt. & Pur. Agt*... Boston, Mass.
J. L. Folsom, *M. M* .... Boston, Mass.
John Coghlan, *M. C. B* .... Boston, Mass.
Boston, Winthrop & Pt. Shirley. 3 g. 2½ m. 1 lo. 8 c.
C. A. Parks, *Man* .... Boston, Mass.
A. E. Walker, *M. M* .... Winthrop, Mass.
Boston & Albany R. R. 4-8½ g. 372 m. 248 lo. 6,012 c.
C. O. Russell, *Gen. Supt* ...... Springfield, Mass.
W. H. Barnes, *Asst. Supt* .... Boston, Mass.
A. B. Underhill, *Supt. M. P*... Springfield, Mass.
F. D. Adams, *M. C. B* .... Allston, Mass.
W. H. Russell, *Div. Supt* .... Albany, N. Y.
Horace Eddy, *For. M. Sh*.. Springfield, Mass.
J. B. Weston, *For. C. Sh*... Springfield, Mass.
G. H. Colby, *For. M. Sh* .... Boston, Mass.
T. B. Purvis, *For. M. Sh* ... Greenbush, N. Y.
J. E. Doran, *For. C. Sh* ...... Greenbush, N. Y.
Boston & Maine R. R. 4-8½ g. 206 m. 84 lo. 2,100 c.
J. T. Furber, *Gen. Supt. & P. A*.. Boston, Mass.
Wm. Smith, *M. M* .... Boston, Mass.
D. C. Richardson, *M. C. B* ..... Lawrence, Mass.
Boston & N. Y. Air Line. 4-8½ g. 53 m. 9 lo. 156 c.
Jos. H. Franklin, *Supt* .... New Haven, Conn.
Boston & Providence R. R. 4-8½ g. 67 m. 47 lo. 866 c.
A. A. Folsom, *Gen. Supt* .... Boston, Mass.
Geo. Richards, *M. M* .... Roxbury, Mass.
Jno. Lightner, *M. C. B* .... Roxbury, Mass.
Bowling Green R. R. 4-8½ g. 5 m. 2 lo. 2 cars.
W. A. Wiggins, *Gen. Man* ... Bowling Green, O.
H. B. Wiggins, *Supt. & M. M*. Bowling Green, O.
Bradford R. R. (*See Olean, B. & W.*)
Bradford, Bordell & Kinzua R. R. 3 g. 30 m. 6 lo. 80 c.
B. C. Williams, *Supt. & Pur. Agt*.. Bradford, Pa.
John Delaney, *M. M. & C. B* ...... Bradford, Pa.
Bradford, Eldred & Cuba R. R.
C. D. Williams, *Supt. & P. A*.. Wellesville, N. Y.
Breakwater & Frankford R. R. (*See Junc. & Break.*)
Brighthope Ry. 3 g. 37 m. 3 lo. 193 cars.
Jas. R. Worth, *Supt* .... Richmond, Va.
A. Gary, *Supt. Way & Works*. Winterpock, Va.
Alex. Calder, *M. M* .... Chester, Va.
Brooklyn, Bath & Coney Is. 4-8½ g. 7 m. 6 lo. 33 c.
Geo. A. Gunther, *Gen. Man* ...... Brooklyn, N. Y.
B'klyn, Flatbush & Coney Is. 4-8½ g. 7½ m. 7 lo. 52 c.
Robert White, *Supt* .... Brooklyn, N. Y.
Brooklyn & Rockaway Bch. 4-8½ g. 3½ m. 3 lo. 18 c.
Wm. Warner, *Supt* .... E. New York, N. Y.
Brunswick & Albany R. R. 5 g. 172 m. 13 lo. 170 c.
R. D. Meader, *Supt* .... Brunswick, Ga.
Buffalo, N. Y. & Phila. Ry. 4-8½ g. 121 m. 34 lo. 2,436 c.
Geo. S. Gatchell, *Gen. Supt* .... Buffalo, N. Y.
J. H. Poole, *Pur. Agt* .... Buffalo, N. Y.
Allen Vail, *Supt. M. P. & M* ..... Buffalo, N. Y.
Henry Wagner, *M. M* .... Buffalo, N. Y.
Buff., Pittsburg & W'n R. R. 4-9 g. 165 m. 33 l. 506 c.
Oliver Watson, Jr., *Gen. Supt* ..... Oil City, Pa.
E. H. Witter, *Pur. Agt* .... Buffalo, N. Y.
H. J. Bookhammer, *M. M* .... Oil City, Pa.
John Monks, *M. C. B* .... Oil City, Pa.
Burlington, Cedar Rapids & Northern Ry.
4-8½ g. 644 m. 62 lo. 2,120 cars.
C. J. Ives, *Gen. Supt* .... Cedar Rapids, Ia.
Robt. Williams, *Supt* .... Cedar Rapids, Ia.
T. Stickney, *Pur. Agt* .... Cedar Rapids, Ia.
R. W. Bushnell, *M. M. & C. B*. Cedar Rapids, Ia.
Burlington & Lamoille R. R. 4-8½ g. 36 m. 3 lo. 61 c.
G. L. Linsley, *Gen. Man. & Supt*. Burlington, Vt.
F. G. Brownell, *M. M. & P. A*... Burlington, Vt.
Burlington & Mo. Riv. R. R. (in Neb.) (*See C., B. & Q.*)
Burlington & North-West'n Ry. 3 g. 38 m. 3 lo. 85 c.
John T. Gerry, *Supt* .... Burlington, Ia.
Burlington & Ohio River R. R.
G. P. Merrill, *Gen. Man. & Pur. Agt*. Chicago, Ill.
J. K. Lape, *Supt. of Equip* .... do.

C

Cairo & St. Louis R. R. 3 g. 146 m. 22 lo. 708 cars.
Chas. Hamilton, *Gen. Supt* .... St. Louis, Mo.
R. M. Pringle, *M. M* .... East Carondelet, Ill.
Camden & Atlantic R. R. 4-8½ g. 79 m. 16 lo. 264 c.
F. A. Lister, *Supt & Pur. Agt* .... Camden, N. J.
Rufus Hill, *M. M* .... Camden, N. J.
Samuel Wills, *M. C. B* .... Camden, N. J.
Canada Southern Ry. 4-8½ g. 403 m. 89 l. 3,367 c.
W. P. Taylor, *Gen. Man* .... Buffalo, N. Y.
A. F. Howland, *Pur. Agt* ..... St. Thomas, Ont.
W. A. Short, *Gen. M. M* .... St. Thomas, Ont.
John Ortton, *Gen. M. C. B*..... St. Thomas, Ont.
Can. Div.: W. E. Carroll, *Supt*.. St. Thomas, Ont.
Robert Potts, *M. C. B* .... St. Thomas, Ont.
U. S. Div.: E. P. Murray, *Supt* .... Toledo, O.
O. P. Dunbar, *M. M* ...... Grosse Isle, Mich.
Canadian Pacific R. R. 4-8½ g. 551 m. 26 lo. 473 c.
W. C. Van Horne, *Gen. Man*. Winnipeg, Man.
Eastern Div. 240 m. 16 lo. 276 cars.
Archer Baker, *Gen. Supt* .... Ottawa, Ont.
Tho. Irwin, *Mech. Supt* .... Brockville, Ont.
Western Div. 311 m. 10 lo. 207 cars.
A. B. Stickney, *Gen. Supt*.... Winnipeg, Man.
Geo. P. Nelson, *Pur. Agt*..... Winnipeg, Man.
F. C. Butterfield, *M. M. & M. C. B*. Winnipeg, Man.
Cape F'r & Yadkin Val. R. R. 4-8½ g. 47 m. 3 lo. 31 c.
L. C. Jones, *Gen. Supt* .... Fayetteville, N. C.
Isaac W. Clark, *M. M. & C. B*.. Fayetteville, N. C.
Carson & Colorado R. R. (*See Va. & Truckee.*)
Catasauqua & Fogelsville. 4-8½ g. 25 m. 6 lo. 577 c.
C. W. Chapman, *Supt. & P. A*. Catasauqua, Pa.
Thos. E. Evans, *M. M* .... Catasauqua, Pa.
Chas. J. Holbach, *M. C. B*..... Catasauqua, Pa.
Central and South-Western Railroads (Ga.).
5 g. 975 m. 127 lo. 1,858 cars.
W. G. Raoul, *V. P. and G. Man*. Savannah, Ga.
Wm. Rogers, *Gen. Supt* .... Savannah, Ga.
Henry Yonge, *Pur. Agt* .... Savannah, Ga.
Cen. Div.: D. D. Arden, *M. M* ...... Savannah, Ga.
John McCann, *M. M* .... Augusta, Ga.
R. M. Barthlemess, *M. C. B*.... Savannah, Ga.
So.-West'n Div.: W. F. Shellman, *Supt*. Macon, Ga.
D. M. Gugel, *M. M* .... Macon, Ga.
James A. Knight, *M. C. B* .... Macon, Ga.
Central R. R. of N. J. 4-8½ g. 544 m. 294 lo. 27,198 c.
Gen. Man... New York, N. Y.
B. W. Burnett, *Pur. Agt* .... New York, N. Y.
W. W. Stearns, *Gen. Supt* ...... Elizabeth, N. J.
Cen Div.: Wm. Woodcock, *M. M* .. Elizabeth, N. J.
Geo. Hackett, *M. C. B* .... Elizabeth, N. J.
C. G. Williams, *M. M* .... Jersey City, N. J.
John Alpaugh, *M. M* .... Phillipsburg, N. J.
N. J. So. Div.: R. Blodgett, *Supt* ... Manchester, N. J.
Chas. N. Sawyer, *M. C. B* .... Manchester, N. J.
Lehigh & Susquehanna Div.:
Wm. Montgomery, *M. M* ... Manchester, N. J.
W. S. Polhemus, *A. G. Supt*. Mauch Chunk, Pa.
L. C. Brastow, *M. M. & C. B* ...... Ashley, Pa.
Long Branch Div.:
J. F. Randolph, *Supt* .... Elizabeth, N. J.
Central R. R. of S. C. (*See Wil. & Wel.*)
Central Iowa Ry. 4-8½ g. 244 m. 37 lo. 1,487 cars.
D. N. Pickering, *Gen. Supt*... Marshalltown, Ia.
John Player, *M. M* .... Marshalltown, Ia.
T. L. Seevers, *M. C. B* .... Marshalltown, Ia.
Central Ontario Ry. 4-8½ g. 32 m. 2 lo. 15 cars.
Geo. W. McMullen, *Gen. Man* ...... Picton, Ont.
Central Pac. R. R. 4-8½ g. 2,777 m. 296 lo. 7,277 c.
A. N. Towne, *Gen. Supt*.... San Francisco, Cal.
J. A. Fillmore, *A. G. Supt*.. San Francisco, Cal.
J. R. Watson, *Gen. Pur. Agt*.. Sacramento, Cal.
A. J. Stevens, *Gen. M. M* ..... Sacramento, Cal.
Benj. Welch, *Gen. M. C. B*.... Sacramento, Cal.
G. J. Turner, *M. C. B* .... Sacramento, Cal.
West'n; Visalia Tulare Divs. and North'n R. R.:
A. D. Wilder, *Supt* .... W. Oakland, Cal.
G. D. Welch, *M. M.* (W. Div.) W. Oakland, Cal.
W. D. Ludlow, *M. C. B.* (W. Div.) do.
S. J. Johnson, *M. M.* (T. Div.)..... Tulare, Cal.
D. Rutherford, *M. M.* (N. Rd.). S. Vallejo, Cal.
Sacramento; Oregon Divs.; and Cal. Pac. R. R.
R. H. Pratt, *Supt* .... Sacramento, Cal.
M. W. Cooley, *M. M* .... Sacramento, Cal.
Phil. Douglas, *For. Car Sh*. Sacramento, Cal.
Truckee Div.: Frank Free, *Supt*. Wadsworth, Nev.
Geo. Gregg, *M. M* .... Wadsworth, Nev.
Wm. McPherson, *F. Car Sh*.. Wadsworth, Nev.
Humb't Div.: G. W. Coddington, *Supt*. Carlin, Nev.
W. F. Smith, *M. M* .... Carlin, Nev.
J. C. Doughty, *For. Car Sh* .... Carlin, Nev.
Salt Lake Div.: A. G. Fell, *Supt* ..... Ogden, Utah.
James Lamb, *M. M* .... Terrace, Utah.
A. Sherburne, *For. Car Sh* ...... Ogden, Utah.

Los Angeles; and Yuma Divs. (So. Pac.):
E. E. Hewitt, *Asst. Supt*.... Los Angeles, Cal.
James Velsir, *M. M* .... Los Angeles, Cal.
J. S. Young, *For. Car Sh*.... Los Angeles, Cal.
Arizona Div. (So. Pac.):
A. A. Bean, *Asst. Supt* .... Tucson, Ariz.
Rio Grande and El Paso Divs. (So. Pac.):
J. Campbell, *Ass't Supt* .... El Paso, Texas.
H. C. Standish, *For. Sh* ...... El Paso, Texas.
Central Vermont R. R. 4-8½ g. 548 m. 132 lo. 2,522 c.
J. W. Hobart, *Gen. Supt* .... St. Albans, Vt.
J. M. Foss, *A. G. S. & S. of M. P. & M*.. St. Albans, Vt
No. Div.: J. B. Futvoye, *Supt*.... St. Johns, P. Q.
Rut. Div.: J. Burdett, *Supt* .... Rutland, Vt.
N. L. Davis, *M. M. & C. B* .... Rutland, Vt.
New London & No'n R. R. 143 m. 22 lo. 303 c.
G. W. Bentley, *G. Supt. & P. A*... New London, Ct.
I. W. Dow, *M. M* .... New London, Ct.
S. O. Banks, *M. C. B* .... New London, Ct.
Chagrin Falls & Southern R. R. 3 g. 6 miles.
Wm. Hutchings, *G. M. & P. A*. Chagrin Falls, O.
J. W. Williams, *Supt* .... Chagrin Falls, O.
Charleston & Savannah Ry. 5 g. 115 m. 17 lo. 98 c.
C. S. Gadsden, *Gen. Supt* ...... Charleston, S. C.
H. A. Ulmo, *M. M* .... Savannah, Ga.
J. D. Murphy, *M. C. B* .... Savannah, Ga.
Charlotte, Columbia & Augusta R. R. (*See Rich. & D.*)
Chateaugay R. R. 3 g. 34 m. 6 lo. 125 cars.
A. L. Inman, *Gen. Man* .... Plattsburg, N. Y.
J. M. Davis, *Supt. & M. M*.... Plattsburg, N. Y.
Chatham Branch Ry. 4-8½ g. 9 m. 1 lo. 2 cars.
J. B. Snowball, *Manager* .... Chatham, N. B.
Chattaroi Ry. 4-8½ g. 43 miles 11 loco. 483 cars.
C. H. Rockwell, *Gen. Man. & P. A*. Ashland, Ky.
W. C. Pendleton, *M. M* .... Ashland, Ky.
Joseph Burley, *M. C. B* .... Ashland, Ky.
Cheraw & Chester R. R. 3 g. 30 m. 3 lo. 38 cars.
W. H. Harding, *Pres. & Supt* ..... Chester, S. C.
A. M. Manning, *M. M* .... Chester, S. C.
Cheraw & Darlington R. R. (*See Wil. & Wel.*)
Cheraw & Salisbury R. R. (*See Wil. & Wel.*)
Cherokee R. R. 3 g. 37 m. 5 lo. 50 cars.
John Postel, *Manager* .... Atlanta, Ga.
C. E. Scruten, *M. M. & C. B*.... Cedartown, Ga.
Chesapeake, Ohio & So.-W'n. 5 g. 365 m. 8 lo. 102 c.
R. Meek, *G. S. & Pur. Agt*. Elizabethtown, Ky.
W. D. Robb, *M. M* .... do.
C. A. Simon, *M. M. & C. B*.. . Paducah, Ky.
Chesapeake & Ohio Ry. 4-8½ g. 642 m. 133 l. 3,543 c.
C. W. Smith, *Gen. Man* .... Richmond, Va.
A. H. Wood, *Asst. to Gen. Man* .... do.
A. S. Emmons, *Pur. Agt* ...... Richmond, Va.
John McFarland, *Supt. M. P* ... Richmond, Va.
Eastern Div.: E. T. Smith, *Supt*.. Richmond, Va.
J. N. King, *M. C. B* .... Richmond, Va.
Hunt. Div.: W. P. Harris, *Supt.*; and
T. L. Chapman, *Asst. Supt. M. P.*; and
H. C. Bassinger, *M. C. B*. Huntington, W. Va.
Lex. Div.: J. D. Yarrington, *Supt*.. Lexington, Ky.
Chesnire R. R. 4-8½ g. 80 m. 30 lo. 499 cars.
R. Stewart, *Gen. Man* .... Keene, N. H.
H. H. Stone, *Pur. Agt* .... Keene, N. H.
F. A. Perry, *M. M* .... Keene, N. H.
A. E. Howard, *G. For. Car Sh*.. . Keene, N. H.
Chester & Lenoir Ry. 3 g. 50 m. 3 lo. 23 cars.
James Mason, *Supt* .... Yorkville, S. C.
T. P. Beard, *M. M* .... Yorkville, S. C.
Chicago, B. & Kan. City Ry. 4-8½ g. 181 m. 9 lo. 130 c.
J. W. Smith, *Gen. Supt* .... Keokuk, Ia.
W. H. Bartlett, *Act. M. M*..... Burlington, Ia.
A. B. Allen, *M. C. B* .... Farmington, Ia.
Chicago, Burlington & Quincy R. R.
4-8½ g. 2,924 m. 441 lo. 16,499 cars.
T. J. Potter, *Gen. Man* .... Chicago, Ill.
H. B. Stone, *Supt. Lo. & Car Dept*.. Chicago, Ill.
Wm. Forsyth, *Mech. Eng* .... Aurora, Ill.
(1) C., B. & Q., East of Mo. Riv. 1,938 miles.
H. B. Stone, *Gen. Supt* .... Chicago, Ill.
Geo. B. Harris, *Pur. Agt* .... Chicago, Ill.
Ill. Divs.: J. D. Besler, *Supt* .... Galesburg, Ill.
Chi. Div.: Geo. Alexander, *Supt*..... Aurora, Ill.
L. E. Johnson, *M. M* .... Aurora, Ill.
Galesburg Div.: F. C. Rice, *Supt*. Galesburg, Ill.
Robert Colville, *M. M* .... Galesburg, Ill.
St. L. Div.: W. R. Crumpton, *Supt*. St. Louis, Mo.
A. Forsyth, *M. M* .... Beardstown, Ill.
Ia. & Mo. Divs.: K. H. Wade, *Supt*.. Burlington, Ia.
East. Div.: C. M. Levy, *Supt*..... Burlington, Ia.
Joel West, *M. M* .... Burlington, Ia.
Mid. Div.: D. T. Bacon, *Supt* ...... Ottumwa, Ia.
West'n Div.: W. T. Ryder, *Supt*.... Creston, Ia.
C. W. Eckerson, *M. M* .... Creston, Ia.
(2) C., B. & Q., West of Mo. Riv. 935 miles.
G. W. Holdredge, *Gen. Supt* ...... Omaha, Neb.
Geo. Hargreaves, *Pur. Agt* .... . Omaha, Neb.
D. Hawksworth, *Gen. M. M*.. Plattsmouth, Neb.
Bur. & Mo. Riv. & Neb. Ry. Divs.:
J. B. Phillippi, *Supt* .... Lincoln, Neb.
O. R. Newton, *M. M* .... Lincoln, Neb.
R. V. Div.: A. Campbell, *Supt*..... Hastings, Neb.
A. & N. Div.: J. McConniff, *Supt*... Lincoln, Neb.
Chicago, Milwaukee & St. Paul R. R.
4-8½ g. 3,951 m. 425 lo. 13,659 cars.
S. S. Merrill, *Gen. Man* .... Milwaukee, Wis.
W. C. Van Horne, *Gen. Supt*... Milwaukee, Wis.
J. T. Crocker, *Pur. Agt* .... Milwaukee, Wis.
J. M. Lowry, *Gen. M. M* .... Milwaukee, Wis.
John Bailie, *Supt. Car Dept*... Milwaukee, Wis.
La Crosse; Pr. du Chien; Wis. Val.; Chi.; and Chi. & Pac. Divs.:
H. C. Atkins, *Supt* .... Milwaukee, Wis.
Northern Div.: L. B. Rock, *Supt*.. Milwaukee, Wis.
Wm. E. Kittredge, *M. C. B*.. Milwaukee, Wis.
So.-Wn. Divs.: D. A. Olin, *Supt* .... Racine, Wis.
John Taylor, *M. M* .... Racine, Wis.
E. A. Eddy, *M. C. B* .... Racine, Wis.
Lines West of Mississippi River:
C. H. Prior, *A. Gen. Supt*.... Minneapolis, Minn.
H. & D. Div.: C. W. Case, *Supt*. Minneapolis, Minn.
J. O. Pattie, *M. M* .... Minneapolis, Minn.
Ia. & Minn. Div.: H. R. Williams, *Supt.* do.
So. M. Div.: F. D. Underwood, *Supt*. La Crosse, Wis
Ia. & Da. Div.: G. W. Sanborn, *Supt*. Mason City, Ia.
S. Cy. & Da. Div.: J. Jackson, *Supt*. Sioux City, Ia.
F. H. Moulton, *M. M* .... Yankton, Dak.
M. Pt. Div.: G. W. Cobb, *Supt*.... Mineral Pt., Wis.
Dubuque Div.: J. H. Jenkins, *Supt*.. Dubuque, Ia.
S. Charnley, *M. M* .... Dubuque, Ia.
Chicago, Pekin & So.-Wn. R. R. 4-8½ g. 88 m. 8 lo. 455 c.
J. Murray, *Supt. & Pur. Agt* ...... Streator, Ill.
A. H. Cook, *Pur. Agt* .... Chicago, Ill.
A. R. Overton, *M. M* .... Joliet, Ill.
F. Shields, *M. C. B* .... Streator, Ill.
Chicago, Rock Island & Pac. Ry.
4-8½ g. 1,381 m. 290 lo. 17,799 cars.
R. R. Cable, *V. P. & Gen. Man*.... Chicago, Ill.
A. Kimball, *Gen. Supt* .... Davenport, Ia.
F. A. Marsh, *Pur. Agt* .... Chicago, Ill.
T. B. Twombly, *Gen. M. M* .... Chicago, Ill.
B. K. Verbryck, *Gen. M. C. B*...... Chicago, Ill.
Ill. Div.: R. H. Chamberlin, *Supt*..... Chicago, Ill.
R. Biester, *M. M* .... Chicago, Ill.
Sam'l Pullman, *M. C. B* .... Chicago, Ill.
Ia. Div.: H. F. Royce, *Supt* .... Des Moines, Ia.
J. G. Crockett, *M. M* .... Stuart, Ia.
Jas. E. Morrill, *M. M* .... Davenport, Ia.
Chas. M. Leonard, *M. C. B* ...... Davenport, Ia.
So.-Wn. Div.: G. F. Walker, *Supt* ..... Trenton, Ia.
R. A. Carscadin, *M. M* .... Trenton, Ia.
Chas. R. Best, *M. C. B* .... Trenton, Ia.
K. & Des. M. Div.: Jno. Given, *Supt*... Keokuk, Ia.
S. W. Wakefield, *M. M* .... Keokuk, Ia.
Henry Kummer, *M. C. B* .... Keokuk, Ia.
Chi., Saginaw & Can. R. R. 4-8½ g. 38 m. 4 lo. 16 c.
J. A. Elwell, *Gen. Man. & Pur. Agt*. St. Louis, Mich.
Jas. T. Hall, *Supt* .... St. Louis, Mich.
Chicago, St. Louis & New Orleans R. R.
4-8½ g. 571 m. 101 lo. 1,913 cars.
J. C. Clarke, *V. P. & G. Man*. New Orleans, La.
L. T. Brien, *Asst. Gen. Man*.. New Orleans, La.
C. M. Sheafe, *Gen. Supt*..... New Orleans, La.
H. B. Febiger, *Pur. Agt* ...... New Orleans, La.
W. H. Purdy, *Supt. Mach*.. McComb City, Miss.
Geo. W. Baxter, *M. C. B*... McComb City, Miss.
So. Div.: E. D. Anderson, *Acting Supt.* do.
E. D. Anderson, *M. M*.... McComb City, Miss.
No. Div.: J. G. Mann, *Supt* .... Jackson, Tenn.
J. M. Keith, *M. M* .... Jackson, Tenn.
J. F. White, *M. M* .... Water Valley, Miss.

Chicago, St. Paul, Minneapolis & Omaha Ry.
4-8½ g. 963 m. 31 lo. 619 cars.
C. F. Hatch, *Gen. Supt* .... St. Paul, Minn.
W. H. S. Wright, *Pur. Agt* .... St. Paul, Minn.
Matt. Ellis, *M. M* .... St. Paul, Minn.
W. B. Rice, *M. C. B* .... St. Paul, Minn.
Ea. & No. Div.: H. Spencer, *Supt*. St. Paul, Minn.
St. Paul Div.: J. F. Lincoln, *Supt*. St. Paul, Minn.
Sioux City Div.: T. P. Gere, *Supt*. Sioux City, Ia.
F. W. Heintselman, *Gen. For. Sh*. Sioux Cy, Ia.
Neb. Div.: G. V. Morford, *Supt* ...... Omaha, Neb.
Chicago, Texas & Mexican Central Ry.
4-8½ g. 52 m. 4 lo. 60 cars.
J. T. Odell, *Gen. Supt* .... Dallas, Tex.
Chas. Howard, *Pur. Agt* .... Chicago, Ill.
Chicago & Alton R. R. 4-8½ g. 840 m. 213 lo. 6,148 c.
J. C. McMullin, *Gen. Man* .... Chicago, Ill.
C. H. Chappell, *G. Supt. & A. G. Man.* do.
A. V. Hartwell, *Pur. Agt* .... Chicago, Ill.
Wm. Wilson, *Supt. of Mach*... Bloomington, Ill.
Jos. Townsend, *G. For. Car Dept.* do.
Chi. Div.: A. M. Richards, *Supt*.. Bloomington, Ill.
St. Louis Div.: T. M. Bates, *Supt*. Roodhouse, Ill.
Kan. Cy. Div.: O. Vaughan, *Supt* ...... Slater, Mo.
Wm. McPhail, *M. M* .... Slater, Mo.
Chicago & Block Coal Ry. 4-9 g. 15 m.
A. F. Beach, *Gen. Man* .... Veedersburg, Ind.
Chi. & East'n Ill. 4-8½ g. 248 m. 56 lo. 3,000 cars.
O. S. Lyford, *Gen. Supt* .... Chicago, Ill.
D. R. Patterson, *Pur. Agt* .... Chicago, Ill.
P. W. Drew, *M. Trans* .... Chicago, Ill.
Allen Cook, *M. M* .... Danville, Ill.
Jas. T. Kerney, *M. C. B* .... Danville, Ill.
Chicago & Grand Trunk Ry. (*See Grand Trunk.*)
Chicago & Iowa R. R. 4-8½ g. 104 m. 15 lo. 237 cars.
W. H. Holcomb, *Rec* .... Rochelle, Ill.
H. S. Bryan, *M. M* .... Aurora, Ill.
Chicago & Northwestern Ry.
4-8½ g. 3,281 m. 476 lo. 16,073 cars.
Marvin Hughitt, *2d V. Prs. & G. M*. Chicago, Ill.
J. D. Layng, *Gen. Supt* .... Chicago, Ill.
W. G. Brownson, *Asst. Supt* .... Boone, Ia.
R. W. Hamer, *Pur. Agt* .... Chicago, Ill.
Geo. W. Tilton, *Supt. M. P. & M.*; and
J. M. Boon, *A. Supt. M. P. & M* . Chicago, Ill.
Wis. and Mil. Divs. & Sheboygan & W'n Ry.:
Chas. D. Gorham, *Supt* .... Chicago, Ill.
Gal. Div.: Chas. Murray, *Supt* .... Chicago, Ill.
Pen'r Div.: W. B. Linsley, *Supt*.... Escanaba, Mich.
Geo. H. White, *M. M* .... Escanaba, Mich.
Mad. Div.: C. A. Swineford, *Supt*. Baraboo, Wis.
Win. & St. P. Div.: S. Sanborn, *Supt*. Winona, Minn
W. A. Scott, *M. M* .... Winona, Minn.
Dak. Cen. Ry.: T. J. Nicholl, *Supt*.... Huron, Dak.
Mil. & Mad. Ry.: J. B. Trull, *Supt* ...... Galena, Ill.
Ia. Div.: J. M. Whitman, *Supt* .... Clinton, Ia.
J. O. Chapman, *M. M* .... Clinton, Ia.
H. L. Preston, *M. C. B* .... Clinton, Ia.
No. Ia. Div.: H. G. Burt, *Supt*.... Eagle Grove, Ia.
Chicago & West Michigan:
Grand Rapids, Newaygo, & Lake Shore; and
Grand Haven R. Rs. 4-8½ g. 362 m. 38 lo. 1,217 c.
Geo. C. Kimball, *V. P. & G. Man*.. Muskegon, Mich.
Albert Scott, *Supt* .... Grand Rapids, Mich.
H. Park, *Pur. Agt* .... Grand Rapids, Mich.
C. & W. M. Rd: C. M. Lawler, *Supt*. St. Joseph, Mich.
Russell Booth, *M. M* .... Muskegon, Mich.
Gr. Hav. Rd.: F. H. May, *Manager*. Allegan, Mich.
Russell Booth, *M. M* .... Muskegon, Mich.
Gr. Rap. Rd.: A. M. Nichols, *Supt*. Gr. Rapids, Mich
C. J. Howard, *M. M* ..... Grand Rapids, Mich.
Cincinnati, Columbus & Hocking Val. Ry.
4-9 g. 25 m. 1 lo. 27 cars.
J. E. Gimperling, *Gen Man* .... Dayton, O.
Geo. F. Robinson, *Supt* .... Washington, O.
Cin., Georgetown & Portsmouth. 3 g. 35 m. 2 lo. 39 c.
A. T. Roever, *Gen Man* .... Cincinnati, O.
J. C. Homer, *M. M* .... Cincinnati, O.
Cincinnati, Green Riv. & Nashville R. R. 3 g.
A. C. Sim, *Supt* .... King's Mountain, Ky.
G. Brashears, *Pur. Agt* .... Cincinnati, O.
Cincinnati, Hamilton & Dayton R. R. (*See C., C., C. & I.*)
Cincinnati, Indianapolis, St. Louis & Chicago Ry.
4-8½ g. 345 m. 60 lo. 1,930 cars.
J. W. Sherwood, *Supt* .... Indianapolis, Ind.
Geo. Tozzer, *Pur. Agt* .... Cincinnati, O.
J. S. Patterson, *M. of Mach. & M. C. B*. Cincinn., O.
Cincinnati, New Orleans & Texas Pacific Ry. Co.
5 g. 841 m. 96 lo. 2,687 cars.
John Scott, *V. Pres. & Gen. Man*.. Cincinnati, O.
James Meehan, *Gen. M. M* .... Ludlow, Ky
Cin. So. Div.: Cecil Fleming, *Gen. Supt*.. Cin., O.
Julius Uihlein, *Pur. Agt* .... Cincinnati, O.
Frank Allingham, *M. M* .... Cincinnati, O.
Ala. Gr. S'n Div.: C. B. Wallace, *Gen. Supt.*, and
R. W. Healey, *Pur. Agt*.... Chattanooga, Tenn.
A. Thomson, *M. M* .... Chattanooga, Tenn.
Fred Morgan, *M. C. B* ..... Chattanooga, Tenn.
V. & M. Div.: E. F. Raworth, *G. S.* Vicksburg, Miss
James B. Browne, *M. M* .... Vicksburg, Miss.
V. S. & P. Div.: F. Y. Dabney, *Supt*.. Monroe, La.
W. Bell Smith, *M. M. & C. B* ...... Monroe, La.
Cincinnati Northern Ry. 3 g. 30 m. 4 lo. 60 c.
G. L. Barringer, *Gen. Man* .... Cincinnati, O.
C. W. Bradley, *Pur. Agt* .... Cincinnati, O.
T. J. Hamer, *M. M. & C. B* .... Cincinnati, O.
Cincinnati, Selma & Mobile R. R. 5 g. 45 m. 2 lo. 39 c.
A. M. Fowlkes, *Supt* .... Selma, Ala.
Simon Hertz, *Pur. Agt* .... Selma, Ala.
J. M. Levis, *M. M* .... Marion, Ga.
Cincinnati South-Eastern Ry. 3 g. 17 m.
John V. Patton, *Gen. Man* .... Newport, Ky.
Cincinnati Southern Ry. (*See Cin., N. O. & Tex. Pac.*)
Cincinnati, Van Wert & Mich. R. R. 4-8½ g. 22 m.
R. J. Cavett, *Supt* .... Van Wert, O.
Cin., Wabash & Mich. Ry. 4-8½ g. 110 m. 8 lo. 139 c.
Norman Beckley, *Gen. Man. & P. A*. Elkhart, Ind.
O. W. Lamport, *Supt* .... Wabash, Ind.
S. B. Tinker, *M. M. & M. C. B*.... Wabash, Ind.
Cincinnati & Eastern Ry. 3 g. 76 m. 4 lo. 66 cars.
G. H. Wilber, *Gen. Supt* .... Cincinnati, O.
Clarksburg, Weston & Glenville R. R.
3 g. 26 m. 2 lo. 21 cars.
A. H. Kunst, *Supt* .... Weston, W. Va.
Sam. A. Steel, *M. M* .... Weston, W. Va.
F. Dillie, *M. C. B* .... Nottingham, O.
Cleve., Akron & Col. R. R. 4-9 g. 144 m. 14 lo. 638 c.
N. Monsarrat, *Gen. Supt* .... Akron, O.
M. M. & C. B .... Akron, O.
Cleve., Col., Cin. & Ind. Ry:
Cin., Ham. & Dayton and Ind. & St. Louis.
4-8½ g. 812 m. 246 lo. 7,082 cars.
J. H. Devereux, *Pres* .... Cleveland, O.
E. B. Thomas, *Gen. Man* .... Cleveland, O.
J. L. Yale, *Pur. Agt* .... Cleveland, O.
W. F. Turreff, *Gen. M. M* .... Cleveland, O.
(1) Cl., Col., Cin. & Ind. Divs. 471 m. 162 lo. 4,768 c.
Col. & Cin. Div.: Robt. Blee, *Supt* . Cleveland, O.
W. L. Gilmore, *M. M* .... Cleveland, O.
A. G. Steinbrenner, *G. For. Car Dept.* do.
Ind'p'lis Div.: C. C. Gale, *Supt*.. Indianapolis, Ind.
Jas. Eckford, *M. M* .... Brightwood, Ind.
N. Mark, *G. For. Car Dept*. Brightwood, Ind.
Day. & Union: H. S. Gordon, *M. M*.... Dayton, O.
(2) Cin., Ham. & Day. Divs. 341 m. 84 lo. 2,314 c.
J. H. Barrett, *Gen. Supt* .... Cincinnati, O.
D. S. Cross, *M. M* .... Cincinnati, O.
W. H. H. Allison, *G. For. Car Dept.* do.
C. R. & C. Div.: W. S. Brewer, *M. M*. Richm'd, Ind.
D. & M. Rd.: *Supt* .... Toledo, O.
Jno. Black, *M. M* .... Lima, Ohio.
Cleve., Painesv'le & Ash. 4-8½ g. 11 m. 3 lo. 22 cars.
Wm. E. Lewis, *Gen. Man* .... Cleveland, O.
F. Dillie, *M. C. B* .... Nottingham, O.
Cleveland & Pittsburg R. R. (*See Penna. Co.*)
Cleveland, Tuscarawas Valley & Wheeling Ry.
4-8½ g. 158 m. 23 lo. 1,522 cars.
Oscar Townsend, *Gen. Man* ...... Cleveland, O.
Wm. Thornburg, *Supt* .... Cleveland, O.
W. A. Stone, *M. M* .... Lorain, O.
Cleve. & Marietta R. R. 4-8½ g. 99 m. 9 lo. 157 cars.
S. C. Baldwin, *Gen. Man* .... Marietta, O.
R. B. Hoover, *Pur. Agt* .... Marietta, O.
E. C. Hill, *M. M* .... Marietta, O.
Coburg, Peterborough & Marmora Ry.
5-6 g. 47 m. 5 lo. 207 cars.
Jas. R. Barber, *Gen. Supt* .... Cobourg, Ont.
Jas. Clark, *M. M* .... Cobourg, Ont.
John Tinney, *M. C. B* .... Cobourg, Ont.
Columbia & Greenville R. R. (*See Rich. & Dan.*)

CLIFF BUFFER.
5½ by 8. 2¼ in. hole.
Capacity, 16,500 lbs.

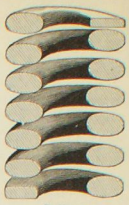
CLIFF & RIGHTER CO.

(Limited),

CHARLES DEW. GIBSON, PREST. EDMUND K. RIGHTER, SECY.
GEORGE B. SLOAN, TREAS. EDWARD CLIFF, SUPERINTENDENT.

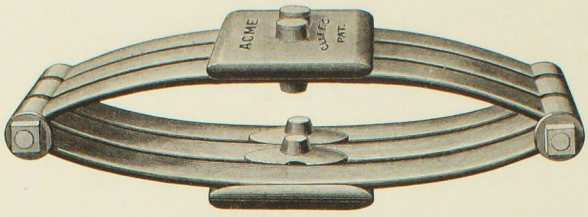
MANUFACTURERS OF

Railway Car Springs,

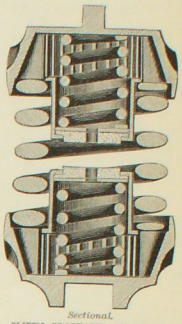


Sectional.
CLIFF BUFFER.
5½ x 8. 2¼ in. hole.
Capacity, 16,500 lbs.

CLIFF'S GRADUATED EQUALIZER.
7⅛ in. diam., 11⅛ in. high.
Capacity graduated from 7,000 to 10,000 lbs.



ACME TRIPLET FREIGHT ELLIPTIC.
CLIFF'S PATENT, MARCH 29, 1881.
22 in. long. 6¼ in. bearing to bearing.
Capacity, 28,500 lbs.



Sectional.
CLIFF'S GRADUATED EQUALIZER.
7⅛ in. diam., 11⅛ in. high.
Capacity graduated from 7,000 to 10,000 lbs.

No. 5 DEY STREET, NEW YORK.

IN THE PATENT FIGHT

BETWEEN

D. A. HOPKINS, of 113 Liberty Street, N. Y.,

PATENTEE AND MANUFACTURER OF

SELF-FITTING JOURNAL BEARINGS,

AND

T. V. LE ROY,

A SECOND DECISION WAS RENDERED JUNE 7, 1881,

IN FAVOR OF HOPKINS.

The closing paragraphs of said decision read as follows:

"As the proofs stand, therefore, Hopkins was the first to conceive, the first to disclose to others, the first to embody in models, the first to reduce to practice, and the first to apply for a patent. Le Roy was first to obtain a patent, but under circumstances which do not give him the prima facie case which a patent usually implies."

"We must find priority of invention to be with D. A. Hopkins, and affirm the examiner's decision."

H. H. BATES,
R. L. B. CLARKE,
R. G. DYRENFORTH,
Examiners-in-Chief.

WILSON, WALKER & CO.

(LIMITED),

MANUFACTURERS OF ALL KINDS OF

RAILROAD CAR AND LOCOMOTIVE FORGINGS,

PITTSBURGH, PA.

PHOTO-ENGRAVING CO.

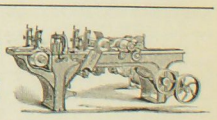
67-69 PARK PLACE, New York.
WESTERN BRANCH
180 DEARBORN ST. CHICAGO.

Engravings for Books and all Advertising purposes. Cheaper than any other Method.

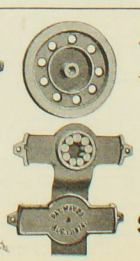
BLIND SHADE
Planing Machine FOR CAR WORK.
The most perfect Machine in use.

LEE'S PATENT
Molding Machines

Five different styles and sizes. These are especially adapted to all classes of car work.



HENRY A. LEE, Manufr, 164 Union St., Worcester, Mass.



ANTI-FRICTION HANGERS

OF ALL SIZES, FOR

WAREHOUSE DOORS,
FREIGHT-HOUSE DOORS,
BAGGAGE-CAR DOORS,
FREIGHT-CAR DOORS,
STREET-CAR DOORS, ETC.

Send for Price List, Illustrated.

MANUFACTURED BY

S. H. & E. Y. MOORE,

163 & 165 LAKE STREET CHICAGO.

Columbus, Hocking Valley & Toledo Ry.
4-9 g. 310 m. 70 lo. 6,000 cars.
Orland Smith, Gen Man...Columbus, O.
G. R. Carr, Gen. Supt. & Pur. Agt. Columbus, O.
J. G. Hutchins, M. M...Columbus, O.
J. M. Rockafield, M. C. B...Columbus, O.
Tol. Div.: M. T. Seymour, Supt...Columbus, O.
Hock. V. Div.: M. P. L. Booth, Supt. Columbus, O.
Ohio Riv. Div.: C. D. Norris, Supt...Logan, O.
Columbus & Maysville Ry. (See Cin. & East.)
Columbus & Rome R. R. 3 g. 32 m. 2 lo. 25 cars.
M. E. Gray, Supt...Columbus, O.
Columbus & Western Ry. 5 g. 89 m. 2 lo. 19 cars.
E. A. Llewellen, Gen. Man...Columbus, Ga.
R. A. Bridges, M. M...Opelika, Ala.
Concord & Claremont R. R. (See Northern of N. H.)
Conn. Riv. and Ver. Val. R. Rs. 4-8½ g. 130 m. 33 lo. 456 c.
J. Mulligan, Supt. & Pur. Agt. Springfield, Mass.
W. H. Stearns, M. M...Springfield, Mass.
Robert Hitchcock, M. C. B...Springfield, Mass.
Connotton Valley R. R. 3 g. 109 m. 10 lo. 531 cars.
Gen Man...Canton, O.
W. N. Moffet, Supt...Canton, O.
A. B. Proal, Pur. Agt...Canton, O.
E. W. Poorman, M. M...Canton, O.
Cooperstown & Susq. Val. 4-8½ g. 16 m. 2 lo. 13 cars.
Andrew Shaw, Pres...Cooperstown, N. Y.
Alonzo Mumford, M. M...Cooperstown, N. Y.
Corning, Cowanasque & An. Ry. (See Syr., G. & C.)
Cornwall R. R. 4-8½ g. 9 m. 5 lo. 166 cars.
Frank Donahue, G. Supt. & M. M. Lebanon, Pa.
Levi Blonch, M. C. B...Lebanon, Pa.
Cotton Plant R. R. 3-6 g. 11 m.
Wm. Black, Pres. & Gen. Man. Brinkley, Ark.
Credit Valley Ry. 4-8½ g. 184 m. 22 lo. 484 cars.
James Ross, Gen. Supt...Toronto, Ont.
John Macnab, Pur. Agt...Toronto, Can.
H. G. Taylor, Mech. Supt...Toronto, Can.
Crown Point Iron Co. R. R. 3 g. 13 m.
A. L. Inman, Gen. Man...Plattsburg, N. Y.
J. M. Davies, Supt. & M. M. Crown Point, N. Y.
J. C. Sherman, M. C. B...Crown Point, N. Y.
Cumberland & Maurice Riv. R. R. 4-8½ g. 22 m.
L. H. Dowdney, Supt...Port Norris, N. J.
Cumberland & Pennsylvania R. R. 4-8½ g. 55 m.
P. L. Burwell, Gen Supt & P. A. Cumberland, Md.
N. W. Howson, Mast. of Mach. Mt. Savage, Md.
Nathan Binix, M. C. B...Mt. Savage, Md.
Cumberland Valley R. R. 4-9 g. 125 m. 21 lo. 280 cars.
J. F. Boyd, Supt...Chambersburg, Pa.
O. N. Lull, Ch. En. & Pur. Agt. Chambersb'g, Pa.
A. S. Hull, M. M...Chambersburg, Pa.
C. Wickey, F. C. R...Chambersburg, Pa.

D

Danbury & Norwalk R. R. 4-8½ g. 33 m. 6 lo. 100 c.
L. W. Sandiforth, G. Supt. & P. A. S. Norwalk, Ct.
N. M. George, M. M. & C. B...Danbury, Conn.
Danville, Mocksville & So.-Wn. R. R. 3 g. 28 m.
H. W. Goodrich, Ch. Eng...Leakesville, N. C.
Danville, Olney & O. R. R. R. 4-8½ g. 110 m. 4 lo. 83 c.
C. Howard, G. Man. & Pur. Agt. Boston, Mass.
J. M. Graham, Supt...Kansas, Ill.
Louis Parisoe, M. M. & C. B...Kansas, Ill.
Dayton & Union R. R. (See Ohio Ry.)
Delaware, Lackawanna & Western R. R.
4-8½ g. 670 m. 348 lo. 26,187 cars.
Wm. F. Halstead, Gen. Supt...Scranton, Pa.
G. W. B. Cushing, Pur. Agt...New York, N. Y.
Walter Dawson, Mast. of Mach...Scranton, Pa.
Robt. McKenna, M. C. B...Scranton, Pa.
Bloomsb'g Div.: C. Graham, M. M. Kingston, Pa.
Utica Div.: A. C. Salisbury, Supt...Utica, N. Y.
Thos. Thatcher, M. M...Utica, N. Y.
Morris & Essex Div. and Sussex R. R.:
A. Reasoner, Supt...Hoboken, N. J.
W. H. Lewis, M. M...Kingsland, N. J.
J. W. Baker, Mast. Car Rep...Dover, N. J.
Oswego & Syracuse Div.:
W. B. Phelps, Supt...Oswego, N. Y.
Jas. Buchanan, M. M...Syracuse, N. Y.
Syracuse, Binghamton & New York R. R.
4-8½ g. 81 m. 20 lo. 598 cars.
W. K. Niver, Gen. Supt...Syracuse, N. Y.
Jas. Buchanan, M. M...Syracuse, N. Y.
Delaware River R. R. 4-9 g. 20 m. 3 lo. 4 cars.
E. H. Green, Supt. & P. A...Pedricktown, N. J.
Delaware Western R. R. 4-8½ g. 20 m. 4 lo. 30 cars.
David Connell, Supt...Wilmington, Del.
Delaware & Chesapeake R. R. 4-8½ g. 54 m. 3 lo. 16 c.
O. S. Sanford, Supt...Oxford, Md.
Joseph A. Baynard, M. M...Oxford, Md.
Chas. E. Mason, M. C. B...Oxford, Md.
Delaware & Hudson Canal Co.
4-3 and 4-8½ g. 596 m. 151 lo. 9,248 cars.
C. F. Young, Gen. Man...Honesdale, Pa.
C. F. Young, Pur. Agt...Albany, N. Y.
R. C. Blackall, Supt. of Mach...Albany, N. Y.
Susq. Div.: C. D. Hammond, Supt. Albany, N. Y.
C. A. Jones, M. M...Oneonta, N. Y.
J. R. Skinner, M. C. B...Oneonta, N. Y.
Sar. & Ch. Divs.: T. Voorhees, Supt...Troy, N. Y.
J. L. Corey, M. M...Green Island, N. Y.
Chr. Körner, M. C. B...Green Island, N. Y.
Pa. Div.: R. Manville, Supt. & Pur. Agt.; and
S. H. Dotterer, M. M...Carbondale, Pa.
T. Orchard, M. C. B...Carbondale, Pa.
Denver & Rio Grande Ry. 3 g. 1,062 m. 170 lo. 4,617 c.
D. C. Dodge, Gen. Man...Denver, Col.
Geo. W. Ristine, Asst. Gen. Man...Denver, Col.
A. B. Garner, Pur. Agt...Colorado Springs, Col.
N. W. Sample, M. M...Denver, Col.
Frank Howard, M. C. B...Burnham, Col.
1st Div.: M. C. Kimberly, Supt...S. Pueblo, Col.
2d Div.: W. H. Bancroft, Supt...Alamosa, Col.
Gun'n Div.: J. A. Myers, Supt...Salida, Col.
B. & E. Riv. Div.: C. Lydon, Supt. Leadville, Col.
San J. Div.: R. M. Ridgeway, Supt. Antonito, Col.
Des Moines & Ft. Dodge. 4-8½ g. 87 m. 11 lo. 158 c.
C. N. Gilmore, Supt...Des Moines, Ia.
John McGrayel, M. M...Grand Junction, Ia.
E. A. Avery, M. C. B...Grand Junction, Ia.
Det., Gr. H. & Mil. Ry. 4-8½ g. 189 m. 36 lo. 478 c.
John Burton, Asst. Man...Detroit, Mich.
John S. Lorimer, Storekeeper...Detroit, Mich.
W. J. Morgan, Supt...Detroit, Mich.
F. Parker, Mech. Supt...Detroit, Mich.
Det., Lansing & No'n R. R. 4-8½ g. 222 m. 84 lo. 1027 c.
John B. Mulliken, Gen. Man...Detroit, Mich.
Allan Bourn, Pur. Agt...Detroit, Mich.
Thos. M. Fish, Gen. Supt...Ionia, Mich.
G. C. Watrous, M. M. & C. B...Ionia, Mich.
Det., Mack. & Marq. R. R. 4-8½ g. 151 m. 8 lo. 227 c.
Thos. McKeown, Gen. Supt...Marquette, Mich.
E. W. Allen, Pur. Agt...Marquette, Mich.
John Wilson, Mech. Supt...Marquette, Mich.
Dorchester & Delaware R. R. 4-8½ g. 33 m.
Thos. E. Wright, Supt...Cambridge, Md.
Dubuque & Dakota R. R. 4-8½ g. 64 m. 2 lo. 54 cars.
A. C. Goodrich, Supt...Waverly, Ia.
W. S. Couch, Pur. Agt...Dubuque, Ia.
Duck River Valley R. R. 3 g. 34 m.
Geo. Childress, Supt...Columbia, Tenn.
Dunkirk, Allegheny Valley & Pittsburgh R. R.
4-8½ g. 91 m. 14 lo. 102 cars.
D. Thayer, Gen. Supt...Dunkirk, N. Y.
R. C. Moore, Pur. Agt...New York, N. Y.
J. C. Haggett, M. M. & C. B...Dunkirk, N. Y.

E

East Alabama Ry. 5 g. 22 m. 3 lo. 12 cars.
W. W. Barnes, Supt...Opelika, Ala.
East Broad Top R. R. 3 g. 30 m. 6 lo. 191 cars.
A. W. Sims, Supt...Orbisonia, Pa.
G. A. Haggerty, M. M...Orbisonia, Pa.
E. St. Louis & Carondelet Ry. 4-9 g. 12 m. 1 lo. 22 c.
Joseph Hill, Gen. Supt...East St. Louis, Mo.
East Tennessee, Virginia & Georgia R. R.
5 g. 1,185 m. 102 lo. 1,597 cars.
Henry Fink, Gen. Man...Lynchburg, Va.
J. F. O'Brien, Gen. Supt...Knoxville, Tenn.
Main Stem; Ohio; and No. Car. Divs.:
F. K. Huger, Supt...Knoxville, Tenn.
B. J. Sitton, M. M...Knoxville, Tenn.
Jos. Armbruster, M. C. B...Knoxville, Tenn.
Selma and Alabama Central Divs.:
John M. Bridges, Supt...Selma, Ala.
Simon Gay, M. M...Selma, Ala.
W. W. Pierce, M. C. B...Selma, Ala.
Memphis & Charleston R. R. (Div.):
R. B. Pegram, Jr., Supt...Memphis, Tenn.
H. N. Burford, M. M...Memphis, Tenn.
J. J. Casey, M. C. B...Memphis, Tenn.
Macon & Brunswick Div.:
G. R. Wagnon, M. M...Macon, Ga.
East Tenn. & W'n No. Car. R. R. 3 g. 15 m. 2 lo. 36 c.
Thomas E. Matson, Supt...Elizabethton, Tenn.
Eastern R. R. 4-8½ g. 283 m. 99 lo. 2,268 cars.
D. W. Sanborn, Mast. of Trans...Boston, Mass.
Geo. J. Fisher, Pur. Agt...Boston, Mass.
Amos Pillsbury, S. M. P. & M...E. Boston, Mass.
J. D. Billings, M. C. B...Salem, Mass.
Con'y Div.: J. W. Sanborn, Supt., Wolfboro J., N. H.
Eastern Kentucky R. R. 4-8½ g. 34 m. 5 lo. 123 c.
H. W. Bates, V. P. & Manager...Greenup, Ky.
Geo. Gibbs, Pur. Agt...Riverton, Ky.
D. S. Weaver, M. M...Riverton, Ky.
Eastern Maine R. R. 3 g. 18 m. 2 lo. 35 cars.
L. L. Lincoln, Supt...Bucksport, Me.
Eastern Ohio R. R. 4-8½ g. 8 m. 1 lo. 2 cars.
W. H. Stevens, Gen. Supt...Cumberland, O.
Eastern Shore R. R. 4-8½ g. 38 m. 2 lo.
W. Thompson, Supt...Princess Anne, Md.
F. Strattner, M. M...Princess Anne, Md.
Elberton Air-Line R. R. 3 g. 50 m. 2 lo. 25 cars.
G. J. Foreacre, Gen. Man. & P. A. Atlanta, Ga.
C. D. Wall, M. M. & C. B...Atlanta, Ga.
Elgin Ry. 14 miles.
C. E. Hallett, Gen. Man...Sussex, N. B.
Elizabeth City & Norfolk R. R. 4-8½ g. 79 m. 5 lo. 96 c.
M. K. King, Gen. Man. & Pur. Agt. Norfolk, Va.
J. S. Whitworth, M. M. & C. B...Norfolk, Va.
Erie & Pittsburgh R. R. (See Penna. Co.)
Eureka & Palisade R. R. 3 g. 97 m. 7 lo. 124 cars.
P. Everts, Gen. Supt & Pur. Agt...Eureka, Nev.
J. P. Rugg, M. M...Palisade, Nev.
A. S. Longley, M. C. B...Palisade, Nev.
Europ. & No. Amer. Ry. 4-8½ g. 114 m. 15 lo. 557 c.
F. W. Cram, Supt. & Pur. Agt...Bangor, Me.
A. O. Bailey, M. M. & C. B. Mattawamkeag, Me.
Evansville, Paducah & Cairo Line. 200 miles.
G. J. Grammer, Supt...Evansville, Ind.
Evansville, Rockport & E'n Ry. 4-9 g. 71 m. 5 lo. 98 c.
H. L. Shepard, Supt...Evansville, Ind.
Evansv. & Terre Haute. 4-8½ g. 114 m. 26 lo. 900 c.
C. J. Hepburn, Gen. Supt...Evansville, Ind.
John Torrence, Gen. For...Evansville, Ind.

F

Fitchburg R. R., 4-8½ g. 189 m. 100 lo. 3,315 cars.
John Adams, Gen. Supt...Boston, Mass.
E. K. Turner, Asst. Supt...Fitchburg, Mass.
F. S. Pratt, Pur. Agt...Boston, Mass.
W. A. Foster, Acting Supt. M. P. & M.; and
J. W. Marden, M. C. B...Charlestown, Mass.
Flint & Pere Marq. 4-8½ g. 318 m. 52 lo. 1,556 cars.
H. C. Potter, Gen. Man...E. Saginaw, Mich.
D. Edwards, Asst. Gen. Man...E. Saginaw, Mich.
G. G. Cook, Pur. Agt...E. Saginaw, Mich.
Sanford Keeler, Gen. Supt...E. Saginaw, Mich.
W. F. Potter, Supt. (E. Div.)...E. Saginaw, Mich.
M. V. Meredith, Supt. (W. Div.) E. Saginaw, Mich.
T. J. Hatswell, M. M...E. Saginaw, Mich.
R. McPherson, M. C. B...E. Saginaw, Mich.
Florida Central & Western R. R.
5 g. 234 m. 16 lo. 160 cars.
Wm. M. Davidson, Gen. Man. Jacksonville, Fla.
J. P. Laird, Supt...Tallahassee, Fla.
Jas. S. McElroy, M. M. & C. B. Jacksonville, Fla.
Florida Southern Ry. 3 g. 50 m. 5 lo. 53 cars.
N. R. Gruelle, Gen. Supt...Palatka, Fla.
F. A. Garrison, Pur. Agt...Palatka, Fla.
J. W. Roberts, M. M. & C. B...Palatka, Fla.
Florida Transit R. R. 5 g. 224 m.
D. E. Maxwell, Gen. Supt...Fernandina, Fla.
John Hedges, Pur. Agt...Fernandina, Fla.
J. V. Webster, M. M...Fernandina, Fla.
G. Hernandez, M. C. B...Fernandina, Fla.
Fonda, Johnst'n & Gloversv. 4-8½ g. 26 m. 5 lo. 18 c.
Lawton Caten, Supt...Gloversville, N. Y.
Fond du Lac, Amboy & Peoria. 3 g. 30 m. 2 lo. 35 c.
Alonzo Kinyon, Supt. & P. A. Fond du Lac, Wis.
Fort Dodge & Fort Ridley R. R. 4-8½ g.
G. R. Pearson, Supt...Fort Dodge, Ia.
Ft. Madison & No.-West'n Ry. 3 g. 41 m. 4 lo. 120 c.
S. B. Kenrick, Supt. & Pur. Agt. Ft. Madison, Ia.
L. Lamb, M. M. & C. B...do.
Ft. Wayne, Cin. & Louisv. 4-8½ g. 108 m. 9 lo. 249 c.
W. W. Worthington, Gen. Supt. Ft. Wayne, Ind.
White Water R. R.
W. D. Morris, M. M. & C. B...Ft. Wayne, Ind.
Ft. Wayne & Jackson. 4-8½ g. 100 m. 10 lo. 353 c.
Gen. Supt. & P. A...Jackson, Mich.
C. W. Hollister M. M. & C. B...Jackson, Mich.
Frederickton Ry. 4-8½ g. 22 m. 2 lo. 22 cars.
F. B. Edgecomb, Supt...Frederickton, N. B.
Freehold & New York Ry. 4-9 g. 15 m. 3 lo. 40 c.
J. E. Ralph, Supt., P. A. & M. M. Keyport, N. J.
Chas. H. Snedeker, M. C. B...Freehold, N. J.
Fulton County N. G. Ry. 3 g. 47 m. 2 lo. 106 cars.
A. C. Atherton, Gen. Supt. & P. Agt. Lewiston, Ill.

G

Galveston, Harrisburg & San Antonio Ry.
4-8½ g. 492 m. 47 lo. 1870 cars.
Jas. Converse, Gen. Supt...Houston, Tex.
Chas. Babbidge, Pur. Agt...Boston, Mass.
D. T. Davis, Supt. M. P. & M...Harrisburg, Tex.
James Alexander, M. C. B...Harrisburg, Tex.
El Paso Div. (See Cen. Pac.) 4-8½ g. 144 miles.
Galveston, Houston & Henderson R. R.
4-8½ g. 50 m. 17 lo. 212 cars.
W. H. Harding, G. Man. & P. Agt. Galveston, Tex.
Allen McCoy, Supt...Galveston, Tex.
J. G. Conlon, M. M...Galveston, Tex.
Geneva, Ithaca & Sayre R. R. (See Lehigh Val.)
Georgia R. R. 5 g. 307 m. 42 lo. 938 cars.
John W. Green, Gen. Man...Augusta, Ga.
John S. Cook, M. M...Augusta, Ga.
T. M. Preval, M. C. B...Augusta, Ga.
Georgia Pacific Ry. (Miss. Div.). 3 g. 43 m. 2 lo. 44 c.
C. M. Bolton, Supt...Greenville, Miss.
W. M. Sutton, Pur. Agt...Greenville, Miss.
Benj. Davis, M. M...Greenville, Miss.
J. B. Shelton, M. C. B...Greenville, Miss.
Grand Haven R. R. (See Chic. & W. Mich.)
Grand Junction R'y. (See Midland of Can.)
G'd Rap., Newaygo & L. S. R. R. (See Chic. & W. M.)
Grand Rapids & Indiana. 4-8½ g. 456 m. 46 lo. 1,566 c.
W. O. Hughart, Gen. Man. Grand Rapids, Mich.
W. R. Shelby, Pur. Agt...Grand Rapids, Mich.
S. D. Bradley, M. M...Grand Rapids, Mich.
No'n Div.: J. M. Metheany, Supt. G'nd Rap., Mich.
So'n Div.: P. S. O'Rourke, Supt. Fort Wayne, Ind.
Grand Tower & Carbondale. 4-8½ g. 25 m. 6 lo. 357 c.
T. M. Williamson, Supt. & P. A...Gr. Tower, Ill.
Hugh Smith, M. M. & C. B...Grand Tower, Ill.
Grand Trunk Ry. 4-8½ g. 1,267 m. 434 lo. 9,403 c.
Joseph Hickson, Gen. Man...Montreal, Can.
Wm. Wainright, Asst. Gen. Man. Montreal, Can.
Gr. Tr. Divs.: W. J. Spicer, Supt. Montreal, Can.
Jno. Taylor, Gen. Storekeeper Montreal, Can.
Herbert Wallis, Mech. Supt...Montreal, Can.
Wm. McWood, M. C. B...Montreal, Can.
F. R. F. Brown, Asst. M. S...Montreal, Can.
J. Davis Barnett, Asst. M. S...Stratford, Ont.
Chi. & Gr. Trunk Ry. 4-8½ g. 330 m. 56 lo. 1,191 c.
S. R. Callaway, Gen. Man...Chicago, Ill.
W. H. Pettibone, Supt...Battle Creek, Mich.
N. Wall, Pur. Agt...Fort Gratiot, Mich.
H. Roberts, Mech. Supt...Port Huron, Mich.
Great Western Ry. 4-8½ g. 823 m. 216 lo. 5,039 c.
F. Broughton, Gen. Man...Hamilton, Ont.
Chas. Stiff, Asst. Gen. Man...Hamilton, Ont.
John Burton, Supt...Hamilton, Ont.
E. R. Baines, Pur. Agt...Hamilton, Ont.
C. K. Domville, Loco. Supt...Hamilton, Ont.
C. F. Hanson, M. M...London, Ont.
Henry Childs, Car Supt...London, Ont.
Green Bay, Winona & St. Paul R. R.
4-8½ g. 250 m. 19 lo. 599 cars.
Timothy Case, V. P., Gen. Man. Green Bay, Wis.
James S. Mott, Pur. Agt...Green Bay, Wis.
Edw. Osborne, M. M...Ft. Howard, Wis.
Greenwich & Johnsonville Ry. 4-8½ g. 15 miles.
J. H. Thompson, Supt...Greenwich, N. Y.
Gulf, Col. & Santa Fé Ry. 4-8½ g. 400 m. 32 lo. 1,000 c.
John Sealy, Gen. Man...Galveston, Texas.
F. P. Killeen, Asst. Gen. Man. & Pur. Agt. do.
G. B. Nichols, M. M...Galveston, Texas.
W. H. Martin, M. C. B...Galveston, Texas.
Gulf, W'n Texas & Pac. Ry. 4-8½ g. 68 m. 6 lo. 70 c.
M. D. Monserrate, Pr. & Supt...Cuero, Texas.
James Mooney, M. M...Cuero, Texas.

H

Halifax & Cape Breton Ry. 4-8½ g. 79 m. 5 lo. 237 c.
H. Abbott, Manager...New Glasgow, N. S.
Hannibal & St. Jo. R. R. 4-8½ g. 292 m. 76 lo. 1,860 c.
John B. Carson, Gen. Man...Hannibal, Mo.
W. R. Woodard, Supt...Hannibal, Mo.
T. L. Dunn, Ch. Eng. & Pur. Agt. Hannibal, Mo.
Jas. Long, Supt. M. P. & Car Dep. Hannibal, Mo.
Hanover Branch Ry. 4-8½ g. 8 m. 2 lo. 18 cars.
E. Y. Perry, Pres...So. Hanover, Mass.
E. A. Josselyn, M. M...So. Hanover, Mass.
Hanover Junction, Hanover & Gettysburg R. R.
4-8½ g. 74 m. 9 lo. 106 cars.
H. A. Young, Gen. Supt...Hanover, Pa.
John J. Bingley M. M...Hanover, Pa.
Henry Britcher, M. C. B...Hanover, Pa.
Harrisburg & Potomac R. R. 4-8½ g. 27 m. 2 lo. 7 c.
R. H. Middleton, Supt...Bolling Springs, Pa.
Hartford & Conn. Val. R. R. 4-8½ g. 45 m. 7 lo. 196 c.
Samuel Babcock, Pr. & Supt...Hartford, Ct.
S. E. Brewer, M. M...Hartford, Conn.
Hartford & Conn. W'n R. R. 4-8½ g. 69 m. 10 lo. 235 c.
John F. Jones, Supt...Hartford, Ct.
J. C. Barton, M. M...Hartford, Ct.
Hartwell R. R. 3 g. 10 m. 1 lo. 3 cars.
E. B. Benson, Supt...Hartwell, Ga.
Housatonic R. R. 4-8½ g. 126 m. 22 lo. 495 cars.
L. B. Stillson, Supt...Bridgeport, Ct.
D. S. Draper, Pur. Agt...Bridgeport, Ct.
N. Slingland, M. M...Falls Village, Ct.
J. J. Ferris, M. C. B...Falls Village, Ct.
Houston Belt Ry. 4-8½ and 3 gauge 50 miles.
S. L. Werden, V. P. & Gen. Man. Houston, Tex.
Houston, East & West Tex. Ry. 3 g. 109 m. 6 lo. 224 c.
Paul Bremond, Pr. & Pur. Agt...Houston, Tex.
E. L. Bremond, Gen. Man...Houston, Tex.
A. Riggs, M. M...Houston, Tex.
Houston & Tex. Cen. Ry. 4-8½ g. 701 m. 78 lo. 2,526 c.
G. Jordan, V. Pr. & Gen. Man...Houston, Tex.
A. H. Swanson, Gen. Supt...Houston, Tex.
E. S. Larchar, Pur. Agt...New York, N. Y.
L. C. Noble, Gen. M. M...Houston, Tex.
James McGee, M. C. B...Houston, Tex.
So. & Wn. Divs.: M. G. Howe, Supt. Houston, Tex.
No. & Ml. Divs.: G. A. Quinlan, Supt., and
C. H. Burns, Asst. M. M...Corsicana, Tex.
No.-Wn. Div.: Donald Allen, Supt...Waco, Tex.
Humeston & Shenandoah R. R.
4-8½ g. 85 m. 5 lo. 72 cars.
F. O. Wyatt, Gen. Man...Clarinda, Ia.
Huntingdon & Br. Top Mt. 4-8½ g. 62 m. 18 lo. 69 c.
Geo. F. Gage, Gen. Supt...Huntingdon, Pa.
Samuel B. Knight, Pur. Agt...Philadelphia, Pa.
William Barkla, M. M...Saxton, Pa.

I

Illinois Central R. R. 4-8½ g. 1,554 m. 224 lo. 6,172 c.
E. T. Jeffery, Gen. Supt...Chicago, Ill.
C. A. Beck, Asst. Gen. Supt...Chicago, Ill.
O. Ott, Pur. Agt...Chicago, Ill.
S. J. Hayes, Supt. of Mach...Chicago, Ill.
W. B. Snow, M. M. Car Works...Chicago, Ill.
Chic. Div.: T. J. Hudson, Supt...Cairo, Ill.
Henry Schlacks, M. M...Chicago, Ill.
Mid. Div.: H. L. Frisbie, Supt...Pontiac, Ill.
Spring. Div.: W. Wilkinson, Supt. Springfield, Ill.
W. B. McKenna, M. M...Clinton, Ill.
No'n Div.: J. C. Jacobs, Supt...Amboy, Ill.
J. B. Edams, M. M...Amboy, Ill.
Ia. Div.: D. W. Parker, Supt...Dubuque, Ia.
Thos. W. Place, M. M...Waterloo, Ia.
South Div.: David Oxley, M. M...Centralia, Ill.
J. J. Giles, M. C. B...Centralia, Ill.
Illinois Midland Ry. 4-8½ g. 176 m. 12 lo. 611 cars.
D. H. Conklin, Rec. & Gen. Man. Terre Haute, Ind.
E. D. Frost, Gen. Supt...Terre Haute, Ind.
J. G. Clifford, M. M...Terre Haute, Ind.
Illinois & St. Louis R. R. 4-8½ g. 18 m. 5 lo. 402 c.
C. H. Sharman, Gen. Supt. & P. A. Belleville, Ill.
E. Hockett, M. M...Belleville, Ill.
Charles Rotha, M. C. B...E. St. Louis Ill.
Indiana, Bloomington & Western Ry.
4-8¾ g. 712 m. 64 lo. 3,650 cars.
C. E. Henderson, Gen. Man. Indianapolis, Ind.
H. C. Norton, Pur. Agt...Indianapolis, Ind.
B. Warren, M. M...Indianapolis, Ind.
Peoria Div.: I. H. Wilson, Supt...Indianapolis, Ind.
St. Louis Div.: I. H. Wilson, Supt...Indnpls, Ind.
Ohio Div.: D. W. C. Brown, Supt...Sandusky, O.
Jos. S. Porter, M. M...Sandusky, O.
Indiana, Illinois & Iowa R. R. 42 miles.
F. M. Drake, Gen. Man...Dwight, Ill.
Ind'p'lis & St. Louis R. R. 266 m. 56 lo. 2,276 c.
C. C. Gale, Gen. Supt...Indianapolis, Ind.
J. L. Yale, Pur. Agt...Cleveland, O.
T. W. Ransom, M. M. & C. B...Mattoon, Ill.
Indianapolis & Vincennes R. R. (See Penna. Co.)
Intercolonial Ry. 4-8½ g. 846 m. 111 lo. 3,223 cars.
David Pottinger, Chief Supt...Moncton, N. B.
T. V. Cooke, Gen. Storekeeper...Moncton, N. B.
H. A. Whitney, Mech. Supt...Moncton, N. B.
Ewd. Shaffer, M. C. B...Moncton, N. B.
Monc. Div.: James E. Price, Supt. Moncton, N. B.
Hal. & St. J. Div.: Jas. Coleman, Supt...Truro, N. B.
No'n Div.: M. Busby, Supt...Cambellton, N. B.
Levis Div.: M. McDonald, Supt. Rivière du Loup, Q.
International Ry. 4-8½ g. 69 m. 2 lo. 12 cars.
D. E. McFee, Supt...Sherbrooke, Que.
International & Gt. N'n R. R. (See St. L., I. M. & S.)
Iowa Eastern R. R. 3 g. 19 m. 1 lo. 32 cars.
H. H. Kerr, Supt...Beulah, Ia.
Iron R. R. 4-10 g. 16 m. 5 lo. 187 cars.
C. C. Clark, Gen. Man...Ironton, O.
Perry Scott, M. M...Ironton, O.
Clem. Roetling, M. C. B...Ironton, O.
Iron Mountain & Helena R. R. 4-8½ g. 27 m. 2 lo. 11 c.
Wm. Bailey, Pres. & Gen. Man...Helena, Ark.
D. Stillinger, Supt...Helena, Ark.
F. M. Green, Pur. Agt...Helena, Ark.
Wm. Summers, M. C. B...Helena, Ark.
Ithaca, Auburn & Western R. R. 4-8½ g. 38 m.
Fred T. Peet, Supt...Auburn, N. Y.
Ira Dunning, M. M...Auburn, N. Y.

J

Jacksonville So.-E'n R. R. 4-8½ g. 54 m. 5 lo. 68 c.
E. S. Greenleaf, Supt...Jacksonville, Ill.
Ira Petrie, M. M...Jacksonville, Ill.
Jacksonv., Pensacola & Mob. (See Fla. Cent. & W.)
Jamesville & Washington. 4-8½ g. 22 m. 3 lo. 24 c.
A. Fisher, Manager...Dymond City, N. C.
J. E. Lordley, M. M. & C. B...Dymond City, N. C.
Jeffersonv'l, Madison & Indpls. R. R. (See Pa. Co.)
Jersey City & Albany R. R. 4-8½ g. 38 m.
J. W. McCulloh, Manager...Jersey City, N. J.
Junction & Breakwater; Breakwater & Frankford; and Worcester R. Rs. 4-8½ g. 101 m. 6 l. 133 c.
J. & B. Rd.: Thos. Groome, Supt...Lewes, Del.
Geo. Messick, M. M...Lewes, Del.
W. H. Virden, M. C. B...Lewes, Del.
B. & F. and W. Rds.: J. L. Mapes, St. Berlin, Md.

K

Kansas Central R. R. (See Union Pacific.)
Kansas City, Fort Scott & Gulf R. R.; and
Kansas City, Lawrence & Southern Kansas R. Rs.
4-8½ g. 729 m. 62 lo. 1,700 cars.
Geo. H. Nettleton, Gen. Man...Kansas City, Mo.
L. W. Towne, Gen. Supt...Kansas City, Mo.
H. P. Jacques, Pur. Agt...Kansas City, Mo.
J. L. Barnes, Supt...Kansas City, Mo.
J. S. McCrum, M. M...Kansas City, Mo.
A. N. Montier, M. C. B...Kansas City, Mo.
Kansas City, St. Joseph & Council Bluffs; and St. Jo. & Des Moines R. Rs. 4-8½ g. 368 m. 38 lo. 1,148 cars.
J. F. Barnard, Gen. Supt. & P. A. St. Joseph, Mo.
F. A. Chase, M. M...St. Joseph, Mo.
Thos. Aylesbury, M. C. B...St. Joseph, Mo.
Kendall & Eldred R. R. (See Olean, B. & W.)
Kent Co.; Sm. & Del. Bay Rds. 4-8½ g. 50 m. 2 c.
Fred Gerker, Gen. Man...Chestertown, Md.
Kentucky Central R. R. 5 g. 148 m. 19 lo. 371 cars.
J. D. Ellison, Gen. Man...Covington, Ky.
J. H. Setchel, Supt. of Trans. & Mo. Po...do.
F. Allingham, M. M...Covington, Ky.
J. L. Hackathorn, M. C. B...Covington, Ky.
Kentucky & South Atlantic Ry. 3 g. 23 m. 3 lo. 52 c.
Geo. B. Harper, Supt. & P. A...Mt. Sterling, Ky.
S. P. Hatfield, M. M...Mt. Sterling, Ky.
Kinzua R. R. (See Olean, B. & W.)
Kingston & Pembroke Ry. 4-8½ g. 65 m. 4 lo. 76 c.
B. W. Folger, Supt...Kingston, Ont.
Wm. Harty, Pur. Agt...Kingston, Ont.
Geo. Becker, M. M...Kingston, Ont.
Knox & Lincoln R. R. 4-8½ g. 49 m. 5 lo. 95 cars.
C. A. Coombs, Supt...Bath, Me.
Wm. A. Field, M. M...Bath, Me.
C. L. Turner, M. C. B...Bath, Me.
Knoxville & Augusta R. R. 4-6 g. 16 m. 2 lo. 34 cars.
J. M. Hood, Supt...Marysville, Tenn.
M. R. Hood, Pur. Agt...Marysville, Tenn.

L

Lake Erie & Western Ry. 4-8½ g. 362 m. 35 l. 1,526 c.
E. H. Waldron, Gen. Man...La Fayette, Ind.
E. H. Andress, Pur. Agt...La Fayette Ind.
H. L. Cooper, Supt. of Equipment...Lima, O.
Sandusky Div.: D. S. Hill, Supt...Fremont, O.
Bloom. Div.: J. B. Clark, Supt...La Fayette, Ind.
Lake George & Muskegon Riv. 4-8½ g. 21 m. 4 lo. 75 c.
W. S. Gerrish, Gen. Man...Muskegon, Mich.
Lake Shore & Michigan So'n Ry.
4-8½ g. 1,243 m. 537 lo. 16,018 cars.
John Newell, Gen. Man...Chicago, Ill.
P. P. Wright, Gen. Supt...Cleveland, O.
A. C. Armstrong, Pur. Agt...Cleveland, O.
James Sedgley, Gen. M. M...Cleveland, O.
John Kirby, Gen. M. C. B...Cleveland, O.
Buffalo Div.: C. B. Couch, Supt...Cleveland, O.
J. S. Graham, M. M...Buffalo, N. Y.
A. C. Robson, M. C. B...Buffalo, N. Y.
Frank. Div.: G. H. McIntire, Supt...Stoneboro, Pa.
Erie Div.: C. B. Couch, Supt...Cleveland, O.
L. O. Gassett, M. M...Cleveland, O.
J. Withycombe, M. C. B...Cleveland, O.
Toledo Div.: Thos. Flesher, Jr., Supt. Cleveland, O.
J. M. Sanborn, M. M...Norwalk, O.
W. O. Smith, M. C. B...Norwalk, O.
Mich. Div.: J. E. Curtis, Supt...Toledo, O.
Det. Div.: T. J. Charlesworth, Supt. Detroit, Mich.
Lansing Div.: W. H. Caniff, Supt...Lansing, Mich.
Western Div.: J. H. Parsons, Supt...Chicago, Ill.
G. W. Stevens, M. M. (M. S. Divs.) Elkhart, Ind.
Frank O. Bray, M. C. B...Adrian, Mich.
Laurel Fork & Sand Hill R. R. 4-8½ g. 6 m. 2 lo. 4 c.
M. C. C. Church, Supt...Parkersburg, W. Va.
Lebanon Springs R. R. 4-8½ g.
W. C. Alstyne, Manager...Albany, N. Y.
J. K. Hotaling, Pur. Agt...Albany, N. Y.
Geo. Tefft, M. M...Chatham, N. Y.
Lehigh Valley R. R. 4-8½ g. 545 m. 321 lo. 33,817 c.
Robt. H. Sayre, Gen. Supt...Bethlehem, Pa.
H. S. Goodwin, Asst. Gen. Supt. Bethlehem, Pa.
L. Chamberlain, Pur. Agt...Philadelphia, Pa.
John S. Lentz, M. C. B...Packerton, Pa.
N. J. Div.: H. E. Packer, Supt...New York, N. Y.
John I. Kinsey, M. M...So. Easton, Pa.
Coal Rds.: J. I. Blakeslee, Supt. Mauch Chunk, Pa.
P. Hofecker, M. M...Weatherly, Pa.
John Campbell, M. M...Delano, Pa.
B. M. Div.: A. G. Brodhead, S...Mauch Chunk, Pa.
D. Clark, M. M...Hazleton, Pa.
Wy. Div.: A. Mitchell, S. & M. M. Wilkesbarre, Pa.
Pa. & N. Y.; and Geneva, Ithaca & Sayre R. Rs.
Wm. Stevenson, Supt...Sayre, Pa.
J. N. Weaver, M. M...Waverley, Pa.
Levis & Kennebec Ry. (See Quebec Central Ry).
Ligonier Valley R. R. 3 g. 11 m. 2 lo. 22 cars.
Thos. A. Mellon, Gen. Manager...Pittsburg, Pa.
Geo. Lenft, Supt. & P. Agt...Latrobe, Pa.
Little Rock, Miss. River & Texas Ry.
4-8½ g. 160 m. 12 lo. 260 cars.
J. A. Woodson, G. S. & P. A. Little Rock, Ark.
F. Hufsmith, M. M. & C. B...Arkansas City, Ark.
Little Rock & Fort Smith. 4-8½ g. 168 m. 12 lo. 353 c.
T. Hartman, Gen. Supt...Little Rock, Ark.
James Eblin, M. M...Argenta, Ark.
James Malone, M. C. B...Argenta, Ark.
Long Island R. R. 4-8½ g. 325 m. 79 lo. 740 cars.
I. D. Barton, Supt...Long Island City, N. Y.
Benj. Norton, Pur. Agt. Long Island City, N. Y.
C. A. Thompson, M. M. & C. B...do.
Long View & Sabine Val. Ry. 3 g. 12 m. 1 lo. 10 cars.
B. Barner, Pr. & Gen. Supt...Long View, Tex.
Louisiana Western R. R. (See Tex. & N. O.
Louisville, New Albany & Chicago Ry.
4-8½ g. 380 miles 33 lo. 2,800 cars.
John MacLeod, Gen. Supt...Louisville, Ky.
Wm. M. Lewis, Pur. Agt...Louisville, Ky.
Josiah Bettis, M. M. & C. B...New Albany, Ind.
Louis., Evans. & St. L. Ry. 4-8½ g. 254 m. 24 lo. 691 c.
St. J. Boyle, V. Pr. & Gen. Man. Louisville, Ky.
R. G. Butler, Gen. Supt...Louisville, Ky.
C. F. Martin, Pur. Agt...Louisville, Ky.
F. M. Mast, M. M...Evansville, Ind.
Louisville & Nashville R. R.
5 g. 2,072 m. 316 lo. 6,131 cars.
Fred. de Funiak, Gen Man...Louisville, Ky.
G. C. Breed, A. Gen. Man. & Pur. Agt. do.
D. W. C. Rowland, Gen. Supt. Trans. do.
Reuben Wells, Supt. Mach...Louisville, Ky.
Louisv. Divs.; and Louisv., Cin. & Lex. Ry. (Cin. Div.)
J. G. Metcalf, Supt...Louisville, Ky.
A. Middleton, M. M. (Lo. Div.)...Louisville, Ky.
J. W. Luttrell, M. M. (Cin. Div.) Louisville, Ky.
W. P. Pike, M. M. (2d & C. Div.) Bowling Green, Ky.
Nash. & D. Div.: J. Geddes, Supt. Nashville, Tenn.
W. H. Thomas, M. M...Nashville, Tenn.
S. & N. A. Div.: E. Marsh, Supt. Birmingham, Ala.
C. W. White, M. M...Birmingham, Ala.
Mob. & M.; N. Div. Pens. & Sel.; Sl. & Mont. R. Rs.:
M. S. Belknap, Supt...Montgomery, Ala.
J. N. Hall, M. M. (Mont. Shops) Montgomery, Ala.
N. O. Div.: J. T. Harrihan, Supt. New Orleans, La.
Wm. Adair, M. M...Mobile, Ala.
Memp. Div.: W. Colcamp, Supt. Memphis, Tenn.
J. V. Slusser, M. M...Memphis, Tenn.
St. L. Div.: J. Montgomery, Supt. Evansville, Ind.
Thos. Walsh, M. M...Mt. Vernon, Ill.
Pensacola and So. Div. Pens. & Selma Rds.:
E. O. Saltmarsh, Supt...Pensacola, Fla.
Louisville & Wadley R. R. 5 g. 10 m.
J. H. Wilkins, Pr. & Supt...Louisville, Ga.

M

Maine Central R. R. 4-8½ g. 355 m. 58 lo. 1,335 c.
Payson Tucker, Supt...Portland, Me.
Ira K. Russell, For. Mach. Sh...Waterville, Me.
C. H. Kenison, For. Car Sh...Augusta, Me.
Manchester & Keene R. R. (See B. L. & C.)
B. F. George, Asst. Supt...Keene, N. H.
Manhattan Ry. 4-8½ g. 32 m. 203 lo. 596 pass. c.
Frank K. Hain, Gen. Man...New York, N. Y.
James Tobin, Pur. Agt...New York, N. Y.
C. L. Green, Supt...New York, N. Y.
T. W. Peeples, M. M...New York, N. Y.
H. A. Webster, M. C. B...New York, N. Y.
Marietta & Cin. R. R. 4-8½ g. 312 m. 65 lo. 1,422 c.
Jas. H. Stewart, Supt...Cincinnati, O.
E. Bosley, M. M...Chillicothe, O.
Marietta & North Georgia R. R. 3 g. 24 m. 1 lo. 5 c.
J. B. Glover, Supt. & P. Agt...Marietta, Ga.
E. A. Withers, M. M...Marietta, Ga.
Marquette, Houghton & Ontonagon R. R.
4-8½ g. 87 m. 30 lo. 2,074 cars.
Samuel Schoch, Gen. Man...Marquette, Mich.
R. M. McCauley, Pur. Agt...Marquette, Mich.
W. H. Williams, M. M...Marquette, Mich.
H. D. Lyons, M. C. B...Marquette, Mich.
Massachusetts Central R. R.
N. C. Munson, Gen. Man...Boston, Mass.
S. H. Munson, Supt. M. P...So. Sudbury, Mass.
McKean & Buffalo R. R. 4-8½ g. 22 m. 2 lo. 8 cars.
S. G. Godden, Supt...Smethport, Pa.
Alex. White, Pur. Agt...Smethport, Pa.
Memphis & Charleston R. R. (See E. Tenn. Va. & Ga.)
Memphis & Lit. Rock R. R. 5 g. 135 m. 14 lo. 272 c.
E. K. Sibley, G. Man. & P. A. Little Rock, Ark.
Wm. E. Smith, Supt...Memphis, Tenn.
Thos. Rennell, M. M...Argenta, Ark.
P. Twitchell, M. C. B...Argenta, Ark.
Mexican Central Ry.
Rudolph Fink, Gen. Man...City of Mexico.
J. H. Garner, Supt...City of Mexico.
Howard Hinckley, Pur. Agt...Boston, Mass.

F. W. Johnson, M. M. .... City of Mexico.
J. H. O'Brien, M. C. B. .... City of Mexico.
Mexican National Ry. .... (See Tex.-Mex.)
Michigan Cen. R. R. 4-8½ g. 958 m. 233 lo. 6,552 c.
H. B. Ledyard, Gen. Man. .... Detroit, Mich.
E. C. Brown, Asst. Gen. Supt. .... Jackson, Mich.
Allan Bourn, Pur. Agt. .... Detroit, Mich.
S. H. Edgerly, Gen. M. M. .... Jackson, Mich.
Robert Miller, Gen. M. C. B. .... Detroit, Mich.
East. Division:
D. S. Sutherland, Supt. .... Detroit, Mich.
Bay City, Saginaw & Mackinaw Divisions:
W. A. Vaughan, Supt. .... Bay City, Mich.
R. P. Baillie, M. M. .... Bay City, Mich.
Main Line; Gr. Rap.; So. Bend; and So. Hav. Divs.:
C. B. Bush, Supt. .... Jackson, Mich.
W'n Divs.: R. H. L'Hommedieu, Supt. Chicago, Ill.
Middleburg & Schoharie; and
Schoharie Valley R. Rs. 4-8½ g. 10 m. 2 lo. 4 cars.
S. S. Danforth, Gen. Supt. .... Middleburg, N. Y.
Middleton & Crawford R. R. 4-8½ g. 13 m. 1 lo. 5 c.
D. Thompson, Supt. .... Thompson Ridge, N. Y.
Midland of Canada. 4-8½ g. 143 m. 12 lo. 503 cars.
Geo. A. Cox, Gen. Man. .... Peterboro, Ont.
W. B. Ferguson, Gen. Supt. .... do.
C. H. Craft, Storekeeper .... Peterborough, Ont.
Wm. Marling, Mech. Supt. .... Port Hope, Ont.
Edward Douglas, M. C. B. .... Port Hope, Ont.
Wm. Polson, M. M. (G. J. Ry.) .... Belleville, Ont.
Victoria Division:
F. B. Polson, M. M. .... Lindsay, Ont.
H. H. Harry, M. C. B. .... Lindsay, Ont.
Toronto & Nipissing Div. 3-6 g. 105 m. 12 lo. 211 c.
J. Haggas, M. M. .... Uxbridge, Ont.
Chas. E. Caron, M. C. B. .... Uxbridge, Ont.
Midland No. Car. Ry. 4-8½ g. 95 m. 9 lo. 54 cars.
J. B. Yates, Gen. Man. .... Newbern, N. C.
Jno. P. Caddagan, Pur. Agt. .... Newbern, N. C.
J. W. Andrews, Supt. .... Goldsboro, N. C.
B. Manly, Supt. of Mach. .... Newbern, N. C.
Milton & Sutherlin N. G. R. R. 3 g. 7 m. 1 lo. 5 cars.
E. R. Williams, G. Man. & P. Agt. .... Milton, N. C.
Milwaukee, Lake Shore & Western Ry.
4-8½ g. 250 m. 28 lo. 809 cars.
H. G. H. Reed, Gen. Man. & P. Agt. Milwaukee, Wis.
J. Donahue, Supt. .... Milwaukee, Wis.
Chas. S. Hayden, Asst. Supt. .... Manitowoc, Wis.
David B. Curtis, Asst. Supt. .... Oshkosh, Wis.
John Hickey, M. M. .... Manitowoc, Wis.
Mineral Range R. R. 3 g. 13 m. 4 lo. 42 cars.
Chas. E. Holland, Pr. & Supt. .... Hancock, Mich.
W. H. Carr, Pur. Agt. .... Hancock, Mich.
T. J. Shellhorn, M. M. .... Hancock, Mich.
C. Angie, M. C. B. .... Hancock, Mich.
Minneapolis, Lyndale & Minnetonka Ry.
3 g. 20 m. 2 lo. 2 motors 39 cars.
Wm. McCrory, Supt. & Pur. Agt., and
R. Curtis, M. M. .... Minneapolis, Minn.
Minneapolis & St. L. Ry. 4-8½ g. 506 m. 60 lo. 1,850 c.
C. H. Hudson, Gen. Man. .... Minneapolis, Minn.
E. B. Parke, Pur. Agt. .... Minneapolis, Minn.
E. Ryder, Supt. .... Minneapolis, Minn.
H. A. Towne, Supt. of Mach. Minneapolis, Minn.
Missisquoi R. R. 4-8½ g. 28 m. 1 lo. 2 cars.
W. C. Smith, Manager .... St. Albans, Vt.
Mississippi Val. & Ship Island. 3-6 g. 20 m. 2 lo. 20 c.
A. L. Jaquith, Supt. & Pur. Agt. Vicksburg, Miss.
Peyton Harrison, M. M. .... Vicksburg, Miss.
Mississippi & Tenn. R. R. 5 g. 101 m. 11 lo. 194 c.
M. Burke, Supt. .... Memphis, Tenn.
J. C. Ramsey, M. M. .... Memphis, Tenn.
S. J. Bolton, M. C. B. .... Memphis, Tenn.
Missouri Pacific Ry. 4-8½ g. 2,132 m. 293 lo. 8,035 c.
A. A. Talmage, Gen. Man. .... St. Louis, Mo.
A. W. Dickinson, Asst. Gen. Supt. St. Louis, Mo.
R. B. Lyle, Pur. Agt. .... St. Louis, Mo.
John Hewitt, Supt. Mach. .... St. Louis, Mo.
John Hodge, Supt. Car Dep. .... St. Louis, Mo.
Main Line, Warder Cumming, Supt. Sedalia, Mo.
C. L. Dunham, Supt. W'n .... Kansas City, Mo.
Le Roy Bartlett, M. M. .... St. Louis, Mo.
Geo. Walshe, M. M. .... Sedalia, Mo.
Ks. & Tex. Div., J. M. Eddy, Supt. .... Sedalia, Mo.
J. C. Barber, Asst. Supt. .... Sedalia, Mo.
Wm. T. Small, M. M. .... Parsons, Kan.
Dallas, Ex., L. L. Keller, Supt. .... Dallas, Tex.
Cen. Br. Div., W. W. Fagan, Supt. Atchison, Kan.
H. V. Faries, M. M. .... Atchison, Kan.
Mobile & Ala. Grand Trunk R. R. 5 g. 59 m. 2 lo. 23 c.
Wm. H. Pratt, Trustee .... Mobile, Ala.
Mobile & Girard R. R. 5 g. 84 m. 5 lo. 80 cars.
W. L. Clark, Gen. Supt. .... Columbus, Ga.
J. C. Albrecht, M. M. .... Columbus, Ga.
A. J. Nix, M. C. B. .... Columbus, Ga.
Mobile & Ohio R. R. 5 g. 528 m. 75 lo. 1,180 cars.
A. L. Rives, V. Pr. & Gen. Man. .... Mobile, Ala.
R. H. Briggs, Gen. M. M. .... Whistler, Ala.
J. T. Booth, M. C. B. .... Whistler, Ala.
So'n Div., I. G. Motley, Supt. .... Mobile, Ala.
John Fitzgerald, M. M. .... Macon, Miss.
No'n Div.: E. S. Horsford, Supt. Jackson, Tenn.
M. T. Carson, M. M. .... Jackson, Tenn.
Mobile & Spring Hill R. R. 5 g. 8 m. 10 lo. 90 cars.
F. Ingate, Supt. .... Mobile, Ala.
Mont Alto R. R. 4-9 g. 21 m. 2 lo. 3 cars.
G. B. Weistling, Supt. & P. A. .... Mont Alto, Pa.
Montgomery & Eufaula Ry. (See Central of Ga.)
Montour R. R. 4-8½ g. 11 m.
C. R. Brown, Supt. .... Imperial, Pa.
J. H. Lewis, M. M. .... Imperial, Pa.
Montpelier & Wells Riv. R. R. 4-8½ g. 38 m. 3 lo. 76c.
W. A. Stowell, Supt. .... Montpelier, Vt.
Montreal, Portland & Boston Ry. 4-8½ g. 18 miles.
Ashley Hibbard, Manager. Frelighsb'g, P. Que.
Montrose Ry. 3 g. 28 m. 2 lo. 3 cars.
J. I. Blakslee, Supt. .... Mauch Chunk, Pa.
Morgan's Louisiana & Tex. R. R. 4-8½ g. 165 m.
G. Pandeley, Supt. .... New Orleans, La.
C. Trumpy, Pur. Agt. .... New Orleans, La.
N. Tilton, M. M. .... Algiers, La.
Wm. O'Brien, M. C. B. .... Algiers, La.
Mount Washington Ry. 3⅛ m. 6 lo. 6 pass. cars.
Walter Aiken, Supt. .... Franklin Falls, N. H.
Muncy Creek Ry. 4-8½ g. 10 m.
Benj. G. Welch, Rec. & P. Agt. Hughesville, Pa.
J. V. Chamberlain, Supt. & M. M. New Orleans.

N

Nantasket Beach R. R. 4-8½ g. 3 m. 2 lo. 6 cars.
Nantucket R. R. 3 g. 3½ miles.
P. H. Folger, Supt. .... Nantucket, Mass.
Narragansett Pier R. R. 4-8½ g. 8 m. 2 lo. 10 cars.
G. D. Lanphear, Supt. .... Peace Dale, R. I.
Nashua & Rochester R. R. (See Wor. & Nash.)
Nashville, Chattanooga & St. Louis R'y.,
5 g. 508 miles 87 lo. 1,521 cars.
F. de Funiak, Gen. Man. .... Louisville, Ky.
J. W. Thomas, G. Supt. & P. Agt. Nashville, Tenn.
M. J. C. Wrenne, Supt. .... Nashville, Tenn.
James Cullen, M. M. .... Nashville, Tenn.
J. G. Sawyer, M. C. B. .... Nashville, Tenn.
Natchez, Jackson & Col. R. R. 3-6 g. 60 m. 4 lo. 32 c.
Belton Mickel, Supt. .... Natchez, Miss.
Naugatuck R. R., 4-8½ g. 61 miles, 12 lo. 334 cars.
Geo. W. Beach, Supt. .... Waterbury, Ct.
Henry Hanford, M. M. .... Bridgeport, Ct.
Geo. W. Gray, M. C. B. .... Bridgeport, Ct.
Nevada Central R. R. (See Union Pac.)
Nevada County N. G. R. R. 3 g. 23 m. 3 lo. 46 cars.
John F. Kidder, Supt. .... Grass Valley, Cal.
Jas. McCormick, M. M. & C. B. Grass Valley, Cal.
New Brunswick Ry. 4-8½ g. 194 m. 12 lo. 266 cars.
E. R. Burpee, Supt. .... Gibson, N. B.
Alfred Seely, Pur. Agt. .... Gibson, N. B.
Jesse Mathews, M. M. .... Gibson, N. B.
T. N. Burpee, M. C. B. .... Gibson, N. B.
New Brunswick & Can. Ry. 4-8½ g. 127 m. 12 lo. 184c.
Henry Osborn, G. M. & P. A. St. Andrew's, N. B.
John Stewart, Supt. .... St. Stephen, N. B.
Thos. Armstrong, M. M. .... St. Andrew's, N. B.
G. Houlton, M. C. B. .... St. Andrew's, N. B.
New Canaan R. R. 4-8½ g. 8 m. 2 lo. 4 cars.
W. E. Raymond, Supt. .... New Canaan, Conn.
A. Lockwood, M. M. .... New Canaan, Conn.
New Castle & Oil City R. R. 4-9 g. 38 m. 4 lo. 30 cars.
A. Vandiwort, Supt. .... New Castle, Pa.
New Haven & Derby R. R. 4-8½ g. 13 m. 3 lo. 58 c.
E. S. Quintard, Supt. .... New Haven, Conn.
J. M. Whitlock, M. M. & C. B. New Haven, Conn.
New Haven & No'mpton. 4-8½ g. 135 m. 26 lo. 572 c.
C. A. Goodnow, Supt. .... New Haven, Ct.
C. N. Yeamans, Pur. Agt. .... New Haven, Ct.
Henry Fox, M. M. .... New Haven, Ct.
John Sweeny, M. C. B. .... New Haven, Ct.
New Jersey & New York Ry. 6 g. 43 m. 6 lo. 40 c.
J. D. Hasbrouck, Gen. Man. Jersey City, N. J.
J. S. Drake, Supt. & M. M. .... Hillsdale, N. J.
L. B. Van Wagoner, M. C. B. .... Hillsdale, N. J.
New Jersey Southern Ry. (See Central, N. J.)
New London Northern R. R. (See Central Ver.)
New Orleans Pacific Ry. 5 g. 85 m. 10 lo. 206 cars.
H. S. Morse, Supt. .... New Orleans, La.
E. R. Smith, M. M. & C. B. .... New Orleans, La.
New Orleans & Selma R. R. 5 g. 21 m. 1 lo. 9 cars.
L. B. Scofield, Supt. .... Selma, Ala.
N. Y. Central & Hudson River R. R.
4-8½ g. 962 m. 676 lo. 22,539 cars.
J. M. Toucey, Gen. Supt. .... New York, N. Y.
R. C. Moore, Pur. Agt. .... New York, N. Y.
Wm. Buchanan, Supt. M. P. .... New York, N. Y.
L. Garey, Supt. Car Dept. .... New York, N. Y.
N. Y. & Har. Div.: C. M. Bissell, Supt. do.
P. McQ. Gibson, M. M. .... New York, N. Y.
C. E. Garey, M. C. B. .... Morrisania, N. Y.
Hud. Riv. Div.: C. M. Bissell, Supt. N. York, N. Y.
Peter Smith, M. C. B. .... New York, N. Y.
E'n Div.: Zenas C. Priest, Supt. .... Utica, N. Y.
G. B. Van Vorst, M. M. .... West Albany, N. Y.
D. Holt, M. C. B. .... West Albany, N. Y.
W'n Div.: Geo. H. Burrows, Supt. Rochester, N. Y.
Amos Gould, M. M. .... E. Buffalo, N. Y.
S. L. White, M. M. .... Syracuse, N. Y.
E. A. Olmstead, M. C. B. .... E. Buffalo, N. Y.
C. H. Burchard, M. C. B. .... E. Rochester, N. Y.
Rd. Donaby, M. C. B. .... Niagara Falls, N. Y.
N. Y. Chic. & St. L. Ry. 4-8½ g. 269 m. 36 lo. 1,063c.
L. Williams, Gen. Man. .... Cleveland, O.
H. L. Morrill, Gen. Supt. .... Cleveland, O.
Eas'tn Div.: Wallace McGrath, Supt. .... Erie, Pa.
Mid. Div.: C. H. Cory, Supt. .... Fostoria, O.
West'n Div.: M. E. Wattles, Supt. .... Chicago, Ill.
New York City & Northern. 4-8½ g. 52 m. 7 lo. 91 c.
F. S. Gannon, Gen. Supt. .... High Bridge, N. Y.
M. McNally, M. of M. .... High Bridge, N. Y.
New York, Lake Erie & Western R. R.
4-8½ g. 1,020 m. 544 loco. 24,400 cars.
Robt. Harris, V. Pr. & G. Man. New York, N. Y.
E. S. Bowen, Gen. Supt. .... New York, N. Y.
J. A. Hardenburg, Pur. Agt. New York, N. Y.
F. M. Wilder, Supt. M. P. & M. .... Susqueh'a, Pa.
E'n Div.: E. O. Hill, Supt. .... Jersey City, N. J.
J. H. Vreeland, M. M. .... Jersey City, N. J.
J. N. Mileham, M. C. B. .... Jersey City, N. J.
Del. Div.: Chas. Neilson, Supt. Port Jervis, N. Y.
J. Van Vechten, M. M. & C. B. Pt. Jervis, N. Y.
Susq. Div.: R. B. Cable, Supt. .... Elmira, N. Y.
V. Blackburn, M. M. .... Susquehanna, Pa.
D. B. Goodell, M. C. B. .... Elmira, N. Y.
Buf. & R. Divs.: C. W. Gardner, Supt.; and
G. B. Ross, M. M. .... Buffalo, N. Y.
M. Wilder, M. C. B. .... Buffalo, N. Y.
B. & S.-W. Div.: C. A. Brunn, Supt. do.
W'n Div.: W. B. Coffin, Supt. Hornellsville, N. Y.
E. H. Griggs, M. M. .... Hornellsville, N. Y.
New York, New Haven & Hartford R. R.
4-8½ g. 203 m. 102 lo. 2,416 cars.
E. M. Reed, V. P. & Gen. Man. New Haven, Ct.
R. N. Dowd, Pur. Agt. .... New Haven, Ct.
N. Y. & N. H. Div.; J. T. Moody, Supt. New York.
Shore Div.: W. H. Stevenson, Supt. N. Haven, Ct.
H. Kettendorf, Supt. M. P. .... New Haven, Ct.
Jas. Denver, M. C. B. .... New Haven, Ct.
Hart. Div.: C. S. Davidson, Supt. .... Hartford, Ct.
John Henny, Jr., Supt. M. P. & M. C. B. .... do.
New York, Ontario & Western Ry.
4-8½ g. 345 m. 79 lo. 1,539 cars.
Jas. E. Childs, Gen. Supt. .... Middletown, N. Y.
Chas. Clark, Pur. Agt. .... Middletown, N. Y.
Edw. Minshull, M. M. & C. B. Middletown, N. Y.
Mid. Div.: N. R. Hankins, Supt. Middletown, N. Y.
No'n Div.: C. W. Lanpher, Supt. .... Norwich, N. Y.
New York, Pennsylvania & Ohio R. R.
4-8½ g. 564 m. 215 lo. 7,387 cars.
P. D. Cooper, Gen. Man. .... Cleveland, Ohio.
J. M. Ferris, Supt. Trans. .... Cleveland, Ohio.
J. H. Holway, Pur. Agt. .... Cleveland, Ohio.
Wm. Fuller, Gen. M. M. & C. B. .... Cleveland, O.
S. V. Smith, Asst. Gen. M. C. B. .... Kent, Ohio.
E'n Div.: A. L. Dunbar, Supt. .... Meadville, Pa.
J. A. Cooper, M. M. .... Meadville, Pa.
D. S. Dockstader, M. C. B. .... Meadville, Pa.
J. F. Fosdick, For. Car Rep. Salamanca, N. Y.
W'n Div.: J. W. Alsop, Supt. .... Galion, O.
Wm Hill, M. M. .... Galion, O.
J. W. Holmes, For. Car Rep. .... Galion, O.
Geo. Wilson, For. Car Rep. .... Dayton, Ohio.
Maho'g Div.: N. F. Wood, Asst. Supt. Cleveland, O.
N. Wright, M. M. .... Cleveland, O.
C. N. Thorp, M. C. B. .... Cleveland, O.
New York, Providence & Boston R. R.
4-8½ g. 72 m. 29 lo. 430 cars.
J. B. Gardner, Supt. .... Providence, R. I.
Giles F. Ward, Pur. Agt. .... Stonington, Conn.
J. H. Anderson, M. M. & C. B. Providence, R. I.
N. Y., Susquehanna & W'n. 4-9 g. 86 m. 20 lo. 350 c.
H. M. Britton, Gen. M. & P. A. New York, N. Y.
W. C. Ennis, M. M. & C. B. .... Wortendyke, N. J.
New York, Texas & Mexican Ry.
C. L. Leslie, Gen. Supt. .... Rosenberg, Tex.
New York, West Shore & Buffalo Ry.
Chas. Paine, Gen. Man. .... New York, N. Y.
Howard Fry, Supt. M. P. .... New York, N. Y.
New York, Woodhaven & Rockaway R. R.
J. M. Lunt, Supt. & P. Agt. .... Hunter's Pt., L. I.
W. B. Turner, M. M. .... Hunter's Point, L. I.
N. Y. & Brighton Beach Ry. 3 g. 3 miles.
Geo. Edw. Harding, Gen. Supt. New York, N. Y.
New York & Norfolk R. R. 4-8½ g. 10 m. 1 lo. 4 c.
U. H. Painter, Supt. .... Pocomoke City, Md.
N. Y. & Greenwood Lake Ry. 4-8½ g. 42 m. 8 lo. 53 c.
J. H. Tinney, Acting Supt. .... Jersey City, N. J.
J. A. Hardenburg, Pur. Agt. Jersey City, N. J.
G. A. Hill, M. M. .... Pompton, N. J.
N. Y. & Manhattan Beach Ry. 3 g. 23 m. 12 lo. 128 c.
D. C. Corbin, Man. Dir. .... New York, N. Y.
O. Fairhurst, M. M. .... Greenpoint, L. I.
New York & New England R. R.
4-8½ g. 463 m. 127 lo. 3,326 cars.
S. M. Felton, Jr., Gen. Man. .... Boston, Mass.
W. W. McKim, Pur. Agt. .... Boston, Mass.
O. M. Shepard, Supt. of Trans. .... Boston, Mass.
Elias E. Pratt, M. C. B. .... Norwood, Mass.
Nor. Div.: P. St. M. Andrews, Supt. .... Norwich, Ct.
Richard Colburn, M. M. .... Norwich, Ct.
Prov. Div.: L. W. Palmer, Supt. .... Providence, R. I.
E. M. Humstone, M. M. .... Hartford, Ct.
Newburg, Duchess & Conn. R. R. 4-8½ g. 58 miles.
C. L. Kimball, Gen. Supt. Dutchess Junc., N. Y.
W. G. Van Buskirk, M. M. & C. B. do.
Newport & Wickford R. R. 4-8½ g. 3 m. 1 lo. 4 cars.
Theo. Warren, Supt. .... Newport, R. I.
Norfolk & Western R. R. 5 g. 428 m. 82 lo. 1,220 c.
Henry Fink, 2d V. Pr. & Gen. Man. Lynchb'g, Va.
W. C. De Armond, Pur. Agt. .... Philadelphia, Pa.
J. P. Minetree, Storekeeper .... Petersburg, Va.
C. Blackwell, Supt. M. P. .... Roanoke, Va.
Va. & Tenn. Div.: F. Sterk, M. M. Lynchburg, Va.
Frank Huger, Supt. .... Lynchburg, Va.
W. A. Morgan, M. C. B. .... Lynchburg, Va.
Nor. & Pt. Div.: N. M. Osborne, Supt.,
J. T. Robinett, M. M. & C. B. Petersburg, Va.
North-Eastern R. R. of Ga. 5 g. 40 m. 2 lo. 18 cars.
H. R. Bernard, Supt. .... Athens, Ga.
Jno. J. Longest, M. C. B. .... Athens, Ga.
North-Eastern R. R. (S. C.) (See Wil. & Wel.)
North Pacific Coast R. R. 3 g. 80 m. 12 lo. 316 cars.
David Nye, Gen. Supt. .... San Rafael, Cal.
W. F. Russell, Pur. Agt. .... San Francisco, Cal.
J. Fowler, M. M. .... Sancelito, Cal.
North-Western Ohio Ry. (See Penna. Co.)
Northern (N. H.), and Concord & Claremont Rys.
4-8½ g. 173 m. 25 lo. 569 cars.
Geo. E. Todd, Supt. .... Concord, N. H.
Ed. Studley, M. M. & C. B. & Pur. Agt. do.
Northern (N. J.) R. R. (See N. Y., L. E. & W'n.)
Northern Central Ry. (See Penna. (R. R.)
North'n Pacific R. R. 4-8½ g. 1,193 m. 104 lo. 3,089 c.
Herman Haupt, Gen. Man. .... St. Paul, Minn.
John H. Ames, Pur. Agt. .... St. Paul, Minn.
Geo. W. Cross, Supt. Trans. .... St. Paul, Minn.
Geo. W. Cushing, Supt. M. P. & M. St. Paul, Minn.
St. P. & Minn. Divs.: B. McHugh, Supt., do.
A. P. Farrar, Supt. Mach. .... Brainerd, Minn.
Dakota Div.: C. T. Hobart, Supt. .... Fargo, Dak.
A. Rupert, M. M. .... Fargo, Dak.
Mo. Div.: D. R. Taylor, Supt. .... Bismarck, Dak.
E. F. Doran, M. M. .... Bismarck, Dak.
(2) Western Div.: J. W. Sprague, Gen. Supt.; and
Otis Sprague, Supt. .... New Tacoma, W. T.
F. C. Ford, M. M. .... New Tacoma, W. T.
S. Wishart, M. C. B. .... New Tacoma, W. T.
Pend d'Oreille Div.:
H. W. Fairweather, Supt.; and
J. F. Curtis, M. M. .... Ainsworth, W. T.
Northern & North-W'n Ry. 5-6 & 4-8½ g. 50 lo. 1,033 c.
James Webster, Supt. .... Toronto, Can.
C. W. Postlethwaite, Pur. Agt. .... Toronto, Can.
P. Clarke, M. M. .... Toronto, Can.

O

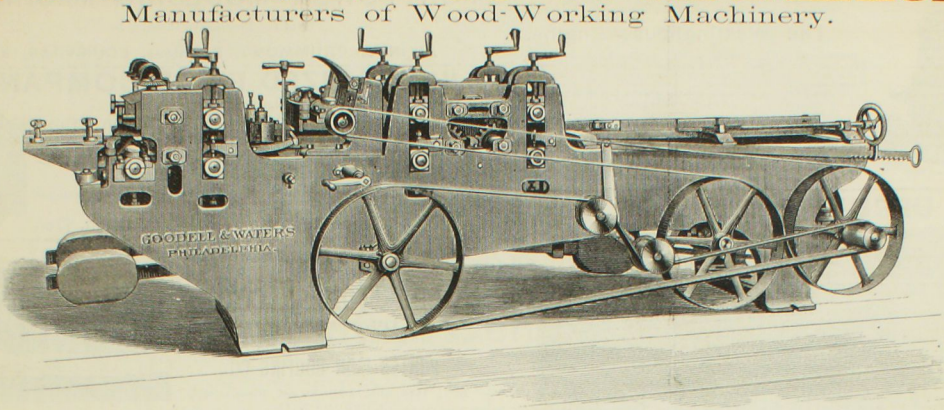
Ogdensburg & Lake Champlain R. R.
4-8½ g. 122 m. 33 lo. 1,160 cars.
A. A. Gaddis, Gen. Man. .... Malone, N. Y.
Abr. Klohs, Supt. & M. M. .... Malone, N. Y.
Ohio Central R. R. 4-8½ g. 230 m. 30 lo. 3,201 cars.
G. G. Hadley, Gen. Man. .... Toledo, O.
W. H. Vandegrift, Supt. .... Toledo, O.
F. W. Stewart, Pur. Agt. .... Toledo, O.
J. B. Morgan, M. M. & C. B. .... Bucyrus, O.
Ohio Southern. 4-8½ g. 116 m. 15 lo. 623 cars.
Ford Woods, Supt. .... Springfield, O.
H. C. Norton, Pur. Agt. .... Indianapolis, Ind.
J. L. Brown, M. M. .... Springfield, O.
Ohio & Mississippi Ry. 4-9 g. 615 m. 14 lo. 2,501 cars.
W. W. Peabody, Gen. Supt. .... Cincinnati, O.
G. E. Atwood, Pur. Agt. .... Cincinnati, O.
Cin. Div.: C. B. Cole, Supt. .... Seymour, Ind.
John Thumser, M. M. .... Seymour, Ind.
J. P. Coulter, M. C. B. .... Aurora, Ind.
Arthur Donaldson, M. M. .... Vincennes, Ind.
St. L. & Sp. Div.: C. M. Stanton, Supt. St. Louis, Mo.
J. W. Stokes, M. M. (Spring. Div.) .. Pana, Ill.
Louisv. Div.: C. B. Cole, Supt. .... Louisville, Ky.
Oil City & Ridgway R. R. 4-8½ g. 6 m. 1 lo. 43 cars.
A. F. Kent, Gen. Man. .... Oil City, Pa.
Old Colony R. R. 4-8½ g. 463 m. 110 lo. 2,862 cars.
J. R. Kendrick, Gen. Supt. .... Boston, Mass.
Main Li. Div.: J. H. French, Supt. .... Boston, Mass.
R. W. Husted, Pur. Agt. .... Boston, Mass.
J. K. Taylor, M. M. .... Boston, Mass.
A. Gleason, M. C. B. .... Boston, Mass.
Cape Cod Div.: C. H. Nye, Supt. .... Hyannis, Mass.
No. Div.: S. A. Webber, Supt. .... Fitchburg, Mass.
George W. Reynolds, M. M. .... Taunton, Mass.
Sam. Stevens, M. C. B. .... Taunton, Mass.
Olean, Bradford & Warren; Bradford; Kinzua; and
Kendall & Eldred R. Rs. 3 g. 38 m. 9 lo. 222 cars.
J. W. Watson, Gen. Supt. .... Olean, N. Y.
J. H. Poole, Pur. Agt. .... Buffalo, N. Y.
Charles Turner, M. M. & C. B. .... Olean, N. Y.
Olympia & Tenino R. R. 3 g. 15 miles.
William Mitchell, Supt. .... Olympia, W. T.
Ontario Southern Ry. 4-8½ g. 24 m. 3 lo. 40 c.
E. R. Mills, Supt. .... Sodus Point, N. Y.
S. B. Stuart, Pur. Agt. .... Sodus Point, N. Y.
W. H. Cook, M. C. B. .... Sodus Point, N. Y.
Oregon Ry. & Nav. Co. 4 8½ g. 225 m. 31 lo. 930 cars.
C. H. Prescott, Manager .... Portland, Ore.
J. M. Buckley, Asst. Man. & Act. Supt. do.
Geo. J. Ainsworth, Supt. (R. Div.) Pt'land, Ore.
K. Von Oterendorf, Supt. (O. Div.) S. F'cisco, Cal.
J. M. Drake, Pur. Agt. .... Portland, Ore.
C. C. Hobart, Gen. M. M. .... The Dalles, Ore.
Chas. A. Phipps, M. C. B. .... The Dalles, Ore.
N. G. Div.: Wm. Reed, Man. .... Portland, Ore.
James Walch, M. M. .... Portland, Ore.
Oregon & California R. R. 4-8½ g. 200 m. 14 lo. 286 c.
R. Koehler, Act. Man. .... Portland, Ore.
J. Brandt, Gen. Supt. .... Portland, Ore.
A. Brandt, M. M. .... Portland, Ore.
Owensboro & Nashville R. R. 5 g. 35 m.
W. L. Gude, Gen. Supt. .... Owensboro, Ky.
H. M. Gable, M. M. & C. B. .... Owensboro, Ky.
Oxford & Henderson R. R. 13 miles.
A. H. A. Williams, Pres. .... Oxford, N. C.

P

Paducah & Elizabetht'n R. R. 5 g. 186 m. 19 lo. 536 c.
Robert Meek, Gen. Supt. .... Elizabethtown, Ky.
W. D. Robb, M. M. & C. B. .... Elizabethtown, Ky.
Painesville & Youngstown R. R. 3 g. 65 m. 7 lo. 319 c.
E. K. Hyndman, Gen. Man. .... Pittsburg, Pa.
J. A. Newcome, Supt. .... Painesville, O.
J. H. Jones, M. M. .... Painesville, O.
Panama R. R. 5 g. 58 m. 14 lo. 534 cars.
H. A. Woods, Supt. .... Aspinwall, U. S. Col.
E. Z. Penfield, Pur. Agt. .... New York, N. Y.
Thomas S. O'Brien, M. M. Aspinwall, U. S. Col.
Parker & Karns City; and
Karns City & Butler R. Rs. 3 g. 27 m. 5 lo. 84 cars.
W. C. Moberly, Gen. Supt. .... Parker City, Pa.
Philip Davies, M. M. .... Parker City, Pa.
Wm. Wolford, M. C. B. .... Parker City, Pa.
Passumpsic R. R. 4-8½ g. 165 m. 28 lo. 105 cars.
E. Raymond, Pres. & Pur. Agt. .... Boston, Mass.
H. E. Folsom, Supt. .... Lyndonville, Vt.
L. L. Brigham, M. M. .... Lyndonville, Vt.
L. F. Woodard, M. C. B. .... Lyndonville, Vt.
Paulding & Cecil Ry. 4-8½ g. 7 m. 2 lo. 24 cars.
S. Frank Eagle, Pres. .... Cecil, O.
Paw Paw and Tol. & S. Haven Rds. 3 g. 13 m. 2 lo. 7 c.
J. Ihling, Supt. .... Lawton, Mich.
Peach Bottom R. R. 3 g. 55 m. 6 lo. 52 cars.
S. M. Manifold, Supt. & Pur. Agt. .... York, Pa.
E. H. Williams, M. C. B. .... York, Pa.
E. Div.: S. Dickey, Supt. .... Oxford, Pa.
G. R. Dickey, Pur. Agt. .... Oxford, Pa.
W. P. Kirk, M. M. .... Oxford, Pa.
Pennsylvania Co.'s (9) Roads.
4-9 g. 2,838 m. 817 lo. 29,432 cars.
Wm. Mullins, Gen. Pur. Agt. .... Pittsburg, Pa.
Joseph Wood, Supt. M. P. .... Fort Wayne, Ind.
(1) Clev. & Pittsb'g R. R. 4-9 g. 224 m. 97 lo. 3,336 c.
R. V. Smith, Asst. Gen. Man. .... Cleveland, O.
Philip Bruner, Supt. .... Wellsville, O.
W. F. Beardsley, Mast. of Mach. Cleveland, O.
(2 & 3) Erie & Ashtabula Rds. 178 m. 29 lo. 1,340 c.
John M. Kimball, Supt. .... Youngstown, O.
J. A. Wood, For. Shops .... Erie, Pa.
(4) Indianap. & Vincennes Rd. 117 m. 11 lo. 303 cars.
Jas. J. Turner, Supt. .... Indianapolis, Ind.
M. M.
(5) Jeffersonville, Madison & Indianapolis R. R.
4-9 g. 217 m. 47 lo. 784 cars.
E. W. McKenna, Supt. .... Louisville, Ky.
Wm. Swanston, M. M. .... Jeffersonville, Ind.
Edw. Austin, M. C. B. .... Jeffersonville, Ind.
(6) Northwestern Ohio Ry. 4-9 g. 79 m.
J. S. Morris, Supt. .... Toledo, O.
(7) Pittsburg, Ft. Wayne & Chicago Ry.
4-9 g. 468 m. 278 lo. 6,782 cars.
E'n Div.: A. B. Starr, Supt. .... Allegheny, Pa.
Geo. J. Parkin, M. M. .... Allegheny, Pa.
W'n Div.: C. D. Law, Supt. .... Ft. Wayne, Ind.
F. D. Casanave, M. M. .... Ft. Wayne, Ind.
(8) Pittsburg, Cincinnati & St. Louis Ry.
4-9 g. 1,172 m. 336 lo. 6,482 cars.
Jas. McCrea, Gen. Supt. .... Columbus, O.
G. W. Rhodes, Supt. M. P. & M. .... Columbus, O.
P. & Col. Div.: E. B. Taylor, Supt. Dennison, O.
Ross Kells, M. M. .... Dennison, O.
A. K. Mansfield, M. C. B. .... Steubenville, O.
Robt. Curtis, M. M. .... Columbus, O.
Thos. Chamberlain, M. C. B. .... Columbus, O.
C. & M. V. Div.: W. F. Black, Supt. Zanesville, O.
Leroy Kells, M. M. .... Lancaster, O.
Daniel Jewell, M. C. B. .... Lancaster, O.
Li. Mi. Div.: Ralph Peters, Supt. .... Cincinnati, O.
Leroy Kells, M. M. .... Cincinnati, O.
M. P. Ford, M. C. B. .... Columbus, O.
Ind. Divs.: J. F. Miller, Supt. .... Richmond, Ind.
Geo. H. Prescott, M. M. .... Logansport, Ind.
Chas. H. Starr, M. C. B. .... Logansport, Ind.
M. J. Rogers, M. M. .... Indianapolis, Ind.
Chi. Div.: C. C. F. Bent, Supt. .. Logansport, Ind.
(9) Terre Haute & Indianapolis R. R.
4-9 g. 374 m. 83 lo. 2,868 cars.
Joseph Hill, Gen. Supt. .... St. Louis, Mo.
C. R. Peddle, P. Agt. & Supt. M. P. & M.; and
E. D. Carter, M. C. B. .... Terre Haute, Ind.
Clinton Idler, M. M. .... Indianapolis, Ind.
Chas. Butler, M. M. .... Effingham, Ill.
A. W. Quakenbush, M. M. .. Logansport, Ind.
Pennsylvania R. R. Co.'s Roads. (7 Gen. Divs.)
4-9 g. 2,704 m. 1,271 loco. 51,894 cars.
Frank Thomson, Gen. Man. .... Philadelphia, Pa.
Enoch Lewis, Pur. Agt. .... Philadelphia, Pa.
John Reilly, Supt. Trans. .... Philadelphia, Pa.
T. N. Ely, Supt. Mo. Po. (4 Gen. Divs.) Altoona, Pa.
(1) Pennsylvania R. R. Divs.
4-9 g. 1,105 m. 627 lo. 35,583 cars.
Charles E. Pugh, Gen. Supt. .... Altoona, Pa.
Phila. Div.: S. M. Prevost, Supt. Philadelphia, Pa.
H. D. Garrett, M. M. .... W. Philadelphia, Pa.
I. W. Van Houten, M. C. B. .... W. Phila., Pa.
Mid. Div.: H. H. Carter, Supt. .... Harrisburg, Pa.
E. L. Caum, M. M. .... Harrisburg, Pa.
Samuel W. Myers, M. C. B. .... Harrisburg, Pa.
Alt'a Div.: Wm. J. Latta, Supt. .... Altoona, Pa.
G. W. Strattan, M. M. .... Altoona, Pa.
John P. Levan, M. C. B. .... Altoona, Pa.
Pitts. Div.: Robert Pitcairn, Supt. .... Pittsburg, Pa.
D. O. Shaver, M. M. .... Pittsburg, Pa.
J. G. Stewart, M. C. B. .... Pittsburg, Pa.
W. Pa. Div.: A. P. Kirtland, Supt. Blairsville, Pa.
C. B. Street, M. M. .... Blairsville, Pa.
M. H. Fails, M. C. B. .... Blairsville, Pa.
Fred. Div.: J. B. Hutchinson, Supt. .... York, Pa.
Tyrone Div.: S. S. Blair, Supt. .... Tyrone, Pa.
Lew. Div.: Wm. M. Phillips, Supt. Lewistown, Pa.
Bed. Div.: Thos. A. Roberts, Supt. .... Bedford, Pa.
Monong. Div.: David M. Watt, Supt. Pittsburg, Pa.
Wm. Lininger, M. M. .... Pittsburg, Pa.
(2) United R. Rs. of N. J. Divs. 414 m. 257 lo. 4,668 c.
F. Wolcott Jackson, Gen. St. Jersey City, N. J.
N. Y. Div.: Robt. E. Pettit, Supt. Jersey City, N. J.
H. S. Hayward, At. St. M. P. Jersey City, N. J.
David H. Baker, M. C. B. .... Jersey City, N. J.
L. A. Bosdevex, M. M. .... Jersey City, N. J.
E. F. Bosdevex, M. C. B. .... Jersey City, N. J.
Belv. Div.: J. A. Anderson, Supt. Lambertv., N. J.
R. McDowell, M. M. .... Lambertville, N. J.
Amboy Div.: J. S. Buckalew, Supt. Camden, N. J.
Thos. Kerr, M. M. .... So. Amboy, N. J.
P. S. Bogart, M. C. B. .... So. Amboy, N. J.
(3) West Jersey R. R. 4-9 g. 163 m. 22 lo. 342 cars.
Joseph Crawford, Supt. .... Camden, N. J.
W. McAllister, M. M. .... Camden, N. J.
C. C. Williams, M. C. B. .... Camden, N. J.
(4) Phila., Wilm. & Balt. R. R. 212 m. 86 lo. 1,488 c.
H. F. Kenney, Gen. Supt. .... Philadelphia, Pa.
S. A. Hodgman, M. M. .... Wilmington, Del.
Wm. Lundgren, M. C. B. .... Wilmington, Del.
Cen. Div.: L. K. Lodge, Supt. .... Philadelphia, Pa.
S. D. Danfield, M. M. & C. B. .... Chester, Pa.
Del. Div.: I. N. Mills, Supt. .... Philadelphia, Pa.
(5) Phila. & Erie R. R. Divs.: 376 m. 117 lo. 3,481 c.
R. Neilson, Gen. Supt. .... Williamsport, Pa.
R. H. Soule, Supt. Mo. Po. .... Williamsport, Pa.
E'n. Div.: Thos. Gucker, Supt. Williamsport, Pa.
Sun. H. & W. Div: F. L. Sheppard, Supt.; and
W. F. Beardsley, M. M. .... Sunbury, Pa.
Mid. Div.: E. B. Westfall, Supt. .... Renova, Pa.
Wm. L. Holman, M. M. .... Renova, Pa.
West'n Div.: J. W. Reynolds, Supt. .... Erie, Pa.
W. T. Smith, M. M. .... Erie, Pa.
(6) Northern Central Ry. 4-9 g. 326 m. 152 lo. 6,163 c.
A. W. Sumner, Pur. Agt. .... Baltimore, Md.
Susq., Shamokin, Elmira & Canadaigua Divs.:
Robert Neilson, Gen. Supt. .... Williamsport, Pa.
R. H. Soule, Supt. M. P. .... Williamsport, Pa.
Susq. Div.: Thos. Gucker, Supt. Williamsport, Pa.
G. W. Demarest, M. C. B. .... Williamsport, Pa.
Sham. Div.: Supt. .... Sunbury, Pa.
Elm. & Can. Divs.: S. Meade, Supt. .... Elmira, N. Y.
Jas. Strode, M. M. .... Elmira, N. Y.
J. C. Dyott, M. C. B. .... Elmira, N. Y.
Baltimore Divs. of Northern Central; and
(7) Baltimore & Potomac R. R. 128 m. 29 lo. 356 c.
G. C. Wilkins, Supt. .... Baltimore, Md.
A. W. Sumner, Pur. Agt. .... Baltimore, Md.
A. O. Dayton, Supt. Mo. Po. .... Baltimore, Md.
J. M. Coale, M. M. .... Baltimore, Md.
Penn. Coal Co.'s R. R. 4-3 g. 67 m. 23 eng. 2,871 c.
J. B. Smith, Gen. Supt. .... Dunmore, Pa.
And. Crane, M. M. .... Dunmore, Pa.
Geo. W. Simpson, M. C. B. .... Dunmore, Pa.
Pennsylvania & Erie R. R.—Early Branch.
C. R. Early, Gen. Supt. .... Ridgeway, Pa.
Pennsylvania & New York R. R. (See Lehigh.)
Pensacola & Perdido R. R. 6 g. 8 m. 5 lo. 73 cars.
B. F. Simmons, Pr. & Supt. .... Pensacola, Fla.
H. W. Simmons, Pur. Agt. .... Pensacola, Fla.
R. G. Nicholl, M. M. & C. B. .... Pensacola, Fla.
People's Ry. 4-8½ g. 6 m. 3 lo. 17 cars.
Chas. Baker, Pres. .... Pottsville, Pa.
Peoria, Decatur & Evansville Ry.
4-8½ g. 215 m. 12 lo. 725 cars.
G. L. Bradbury, Gen. Man. .... Peoria, Ill.
Supt. & Pur. Agt. .... Peoria, Ill.
P. Reilly, M. M. .... Mattoon, Ill.
Peoria & Farmington R. R. 4-8½ g. 25 m. 2 lo. 25 c.
D. P. Phelps, Gen. Man. .... Monmouth, Ill.
John F. Wallace, Supt. .... Farmington, Ill.
Peoria & Pekin Union Ry. 4-8½ g. 20 m. 12 lo. 100 c.
Thos. B. Burnett, Gen. Supt. & P. A. Peoria, Ill.
R. F. Hurd, M. M. & C. B. .... Peoria, Ill.
Perkiomen R. R. 4-8½ gauge 39 miles.
D. B. Clack, Supt. .... Norristown, Pa.
Petersburg R. R. 4-8½ g. 64 m. 10 lo. 131 cars.
R. M. Sully, Gen. Supt. .... Petersburg, Va.
L. E. Clark, Pur. Agt. .... Petersburg, Va.
R. B. Andrews, M. M. .... Petersburg, Va.
J. W. Fleming, M. C. B. .... Petersburg, Va.
Phila., Marlton & Medford R. R. (Op. by Cam. & At.)
Phila., Wilmington & Balt. R. R. (See Penna. R. R.)
Phila. & Atlantic City Ry. 3-6 g. 65 m. 11 lo. 134 cars.
Ellis Clark, Supt. & Pur. Agt. Philadelphia, Pa.
J. W. Wright, M. M. .... Camden, N. J.
E. Lippincott, M. C. B. .... Camden, N. J.
Phila. & Reading. 4-8½ g. 869 m. 516 lo. 21,960 cars.
John E. Wootten, Gen. Man. .. Philadelphia, Pa.
W. S. Wilson, Pur. Agt. .... Philadelphia, Pa.
Geo. Eltz, Supt. Trans. .... Reading, Pa.
L. B. Paxson, Eng. of Mach. .... Reading, Pa.
John H. Rankin, M. C. B. .... Reading, Pa.
No. Pa. & B. Brk. Div.: I. A. Sweigard, Supt., and
Jackson Richards, M. M. .... Philadelphia, Pa.
C. & W. Br.: D. C. Reinhart, Sup. Williamsport, Pa.
W. H. Ellis, M. M. .... Catawissa, Pa.
C. D. Ellis, M. C. B. .... Catawissa, Pa.
Leb. & Tr. Br.: H. W. Tracy, Supt. Pine Grove, Pa.
Coal Br.: J. H. Olhausen, Supt. Mahony Plane, Pa.
R. & C. Br.: A. M. Wilson, Supt. .... Columbia, Pa.
P. N. & N. Y. Rd.: W. M. Geary, S. Morristown, Pa.
S. & Le. Rd.: E. Dale, Supt. .... Reading, Pa.
Pittsburg, Bradford & Buffalo Ry. 3 g. 31 m. 4 lo. 79c.
J. M. Dickey, Gen. Man. .... Foxburg, Pa.
M. Mandeville, Supt. .... Foxburg, Pa.
Pittsburg, Cincinnati & St. Louis Ry. (See Penna. Co.)
Pittsburg, Ft. Wayne & Chicago Ry. (See Penna. Co.)
Pittsburg Southern Ry. 3 g. 38 m. 4 lo. 64 cars.
Supt. & P. A. .... Pittsburg, Pa.
W. S. Marshall, M. M. .... Pittsburg, Pa.
E. B. Gosline, M. C. B. .... Pittsburg, Pa.
Pitts. & Castle Shannon R. R. 3-4 g. 9 m. 5 lo. 388 c.
James M. Bailey, Gen. Supt. .... Pittsburg, Pa.
A. C. Hays, Supt. .... Pittsburg, Pa.
Holmes Ward, M. M. .... Castle Shannon, Pa.
Wm. E. Long, M. C. B. .... Pittsburg, Pa.
Pitts. & Lake Erie R. R. 4-8½ g. 70 m. 30 lo. 1,688 c.
W. C. Quincy, Gen. Man. .... Pittsburg, Pa.
R. W. Jones, Mast. Trans. .... Pittsburg, Pa.
S. W. Haines, M. M. .... Pittsburg, Pa.
Pittsburg & Western R. R. 3 g. 47 m. 2 lo. 76 cars.
E. K. Hyndman, Gen. Man. .... Pittsburg, Pa.
C. P. Ford, Pur. Agt. .... Allegheny, Pa.
W. L. Hofecker, M. M. .... Zelienople, Pa.
Port Huron & No.-Western Ry. 3 g. 105 m. 4 lo. 66 c.
H. McMorran, G. Man. & P. A. Port Huron, Mich.
I. R. Wadsworth, Supt. .... Port Huron, Mich.
Chas. Deifenbaugh, M. M. .... Port Huron, Mich.
Benj. Hillier, M. C. B. .... Port Huron, Mich.

GOODELL & WATERS,

Manufacturers of Wood-Working Machinery.



KEYSTONE RAPID FEEDING FLOORER

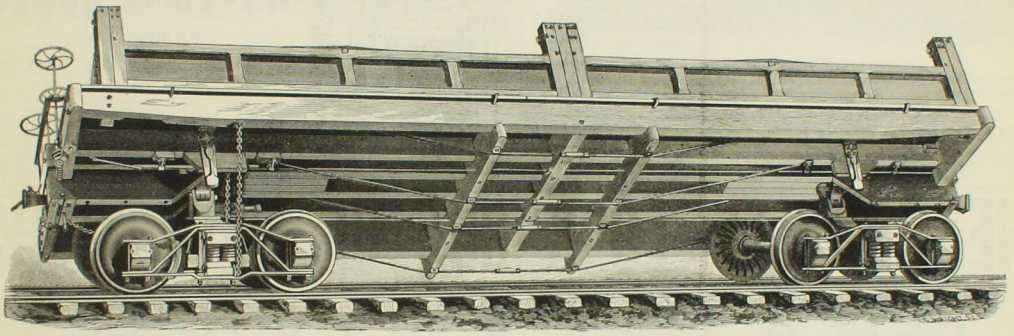
For RAILROAD SHOPS, CAR-BUILDERS, PLANING-MILLS, BRIDGE BUILDERS, SASH, DOOR and BLIND MAKERS.

SEND FOR NEW CATALOGUE.

GOODELL & WATERS, Thirty-First and Chestnut Streets, Philadelphia, Pa.

THE U. S. CAR CO.'S SCREW LEVER DUMP AND COAL CAR.

SIMEON BROWNELL, President and General Manager. FRANK BROWNELL, Treasurer. M. VAN WORMER, Superintendent.



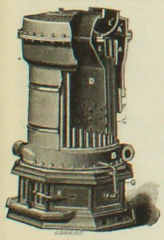
(M. VAN WORMER PATENTS.)

This car has a capacity of eighteen to twenty tons, and can be handled by one man, discharging its load instantly. The device can be applied to flat and grain cars. The car is under perfect control at all times, and can be held at any elevation or dumped suddenly if desired. For construction trains, cars with this device would be invaluable. The mechanism is strong, simple and durable. The following railroads and car-builders are building cars with this screw lever attachment, viz.:

Union Pacific Railway Co.	Northern Pacific Railroad Co.	Wells & French Car Co., Chicago.	Denver Railroad Construction, Land & Coal Co., of Denver.
Gill Car Mfg. Co., Columbus, O.	Joliet Steel Co., of Chicago.	Cleveland Rolling Mills Co., Cleveland.	Ontario Car Co., London, Ontario, Canada.
Main Central Railroad Co.	Columbus, Hocking Valley & Toledo Railway.	John L. Gill, Jr., Car Co., Pittsburgh.	
Hillmeyer & Small Co., York, Pa.			

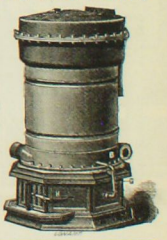
UNITED STATES CAR COMPANY, 48 CONGRESS STREET, BOSTON, MASS.

THE SALMON CAR HEATER.



This Heater Insures Safety in case of Accident, Economy in Fuel and RAPID CIRCULATION. It heats quickly, is SELF-REGULATING, and can be used for either STEAM OR HOT WATER.

The Water Tubes do not come in contact with the Coals, but occupy the Smoke Flue in such a manner as to absorb the greatest amount of heat from Coal in a low state of combustion without danger of chilling the fire.



CORRESPONDENCE SOLICITED.

THE SALMON CAR HEATER COMPANY,

OFFICE, 35 CONGRESS STREET, BOSTON, MASS.

CAR-BUILDER SUPPLEMENT AND EXPORT EDITION,

READY JUNE 1,

AND WILL CONTAIN

Complete Lists of all Car, Locomotive, Car-Wheel, Axle and Car-Spring Manufacturers.

Also Street Railway Companies of the United States and Canada, their Officers, the number of Cars, Horses, Gauge, Mileage, Weight of Rail, and all the West Indian, Central and South American Railroads, with names of Officers, number of Cars, Locomotives, Mileage, Weight of Rail, etc.

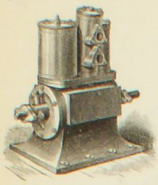
Advertising Rates given on application, and Copies for sale at the office of

THE NATIONAL CAR-BUILDER, - - - NEW YORK.

GEORGE WESTINGHOUSE, JR., President. RALPH BAGALEY, Secretary and Treasurer. H. H. WESTINGHOUSE, Superintendent.

THE WESTINGHOUSE MACHINE COMPANY,

MANUFACTURERS OF



The Westinghouse Engine.

Requires no Setting, Lining, Keying up, Packing or Lubrication, hence *Dispenses Entirely with Skilled Engineers*, and being designed for Hard Work at High Speed is especially adapted to Electric Lighting, as well as the general power for all purposes.

Built Strictly to Gauge and Parts Interchangeable.

2 TO 150 HORSE POWER.

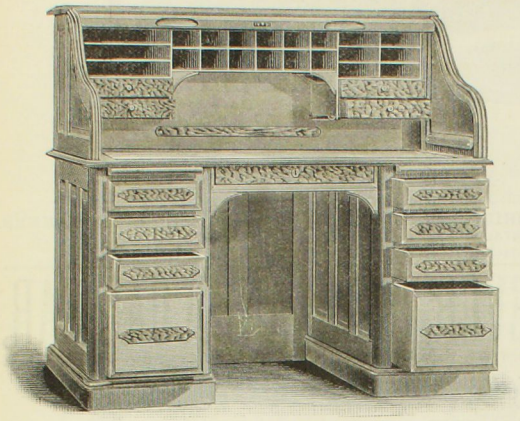
DAMASCUS BRONZE.

A composition unequaled in Strength, Durability, Anti-friction Qualities and Price, hence especially adapted to LOCOMOTIVE AND CAR JOURNALS, &c. Send for Illustrated Circular to

General Sales Offices, 92 and 94 Liberty St., New York.

Works: Pittsburgh, Pa.

THE DERBY ROLL TOP DESK.



DESK No. 15, PLAIN RAISED PANELS.

In Design, Material used, Workmanship, and Elegant, Durable Finish these Desks are unsurpassed. Many unsought Testimonials in our possession prove their popularity with those using them.

PRICES LOW FOR FIRST-CLASS GOODS.

Manufactured by GEO. H. DERBY & CO.,

55 CHARLESTOWN STREET, BOSTON, MASS.

Catalogues Furnished on Application.

FOUNDRYMEN ATTENTION!

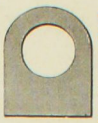
FOR POWER MOULDING MACHINES

Send for Descriptive Circular to

AIKIN & DRUMMOND, Patentees, LOUISVILLE, KY.

VULCANIZED FIBRE COMPANY,

SOLE MANUFACTURERS OF



HARD & FLEXIBLE VULCANIZED FIBRE.

Flexible Vulcanized Fibre Dust Guards and Oil-Box Covers,

being absolutely unaffected by oil or heat, are far more durable and efficient than Leather, and much cheaper.

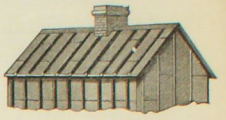
Office and Works; Wilmington, Del.

The Largest Manufacturers OF

Sheet-Iron Roofing

IN THE UNITED STATES.

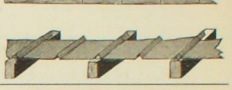
Can give the best of References in every State and Territory.



PORTER IRON ROOFING CO.,

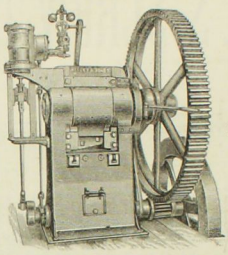
101, 103 and 105 West Front St., Cincinnati, O.

All kinds of Corrugated Iron furnished.



Send for Illustrated Catalogue and Mention this Paper.

BAR IRON SHEAR



MADE BY

HILLES & JONES,

WILMINGTON, DEL.

For Locomotive Builders, Bolt Makers, Bridge Builders, Rolling Mills.

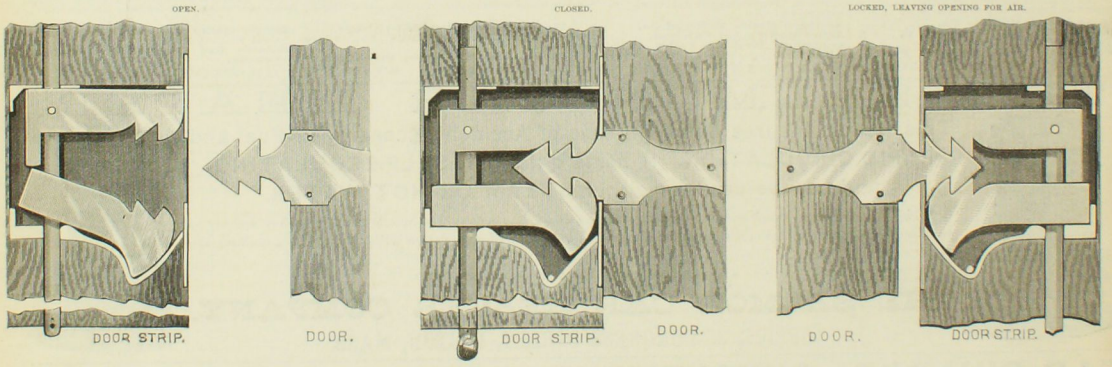
Will cut Flat, Round or Puddle Bars. Made with clutch for stopping and starting cutter, while gearing is in motion, enabling a bar of iron to be cut accurately to the mark. Also has gauge for cutting pieces of uniform length. Is furnished with tight and loose pulley, or pony engine, as desired. Send for circular.

THE GRAVITY LOCK CO., OF NEW YORK,

SOLE OWNERS AND MANUFACTURERS OF

GRAVITY LOCKS.

OPEN. CLOSED. LOCKED, LEAVING OPENING FOR AIR.



PATENTED 1881 AND 1882.

ESPECIALLY ADAPTED FOR

RAILROAD CARS, STATION WAREHOUSES AND ALL SLIDING DOORS.

ADVANTAGES:

1st. Cheapness, Simplicity, Durability, Self-locking (without key or spring).
2d. Easily applied to a "car door," or any other sliding door.
3d. Cannot be opened when the car is in motion.
4th. So constructed as to give *great* strength.
5th. When applied, it is thoroughly protected from rain, snow and dirt.
6th. Holds the door so closely that it is impossible for sparks to blow between the "*strip*" and "*door*."
7th. *Cannot be seen from the* OUTSIDE *when attached to the car.*
8th. Holds door so firmly that it cannot rattle and shake while cars are running; therefore, stops wear and tear of door-hangers.
9th. ALWAYS READY *for use*, NO STAPLES, HASPS OR CHAINS REQUIRED.
10th. Door cannot swing out, drop off, strike passing trains, bridges, etc., while cars are in motion.
11th. Should cars be overturned, the lock will hold door firmly.
12th. NO CHANGE IN CAR-DOORS REQUIRED, and when applied will last as long as any part of the car.
13th. Can use *padlock* or SEAL, in connection, and when attached, great portion of the door must be cut away before it can be unlocked, unless the SEAL or lock is first DETACHED.
14th. Car can be SECURELY locked, leaving an OPENING for air when desired.
15th. An excellent device for station warehouses having sliding doors.
16th. Can be applied to OLD cars as readily as new ones.

*** *The Gravity Lock has been purchased by many leading railroads, and its sale is increasing rapidly.*

ADDRESS ALL COMMUNICATIONS TO

J. W. KREPPS, President, - 171 Broadway, New York.

WILL BE OFFERED FOR SALE, AT AUCTION,

AT THE OFFICE OF THE WORKS,

At Bellefonte, Centre County, Pa.,

AT 2 P. M.,

ON WEDNESDAY, MAY 17, 1882.

These works have a capacity of eight freight cars per day, occupy over eight acres of ground, with a reserve of nearly two acres for future extension, and have over 550 yards of railroad track complete, connecting with the Pennsylvania Railroad.

The Buildings consist of:

Machine Shop, brick, slate roof, 62 feet by 72 feet.
Framing Shop, brick, two stories, 62 feet by 150 feet.
Erecting Shop, brick, containing 7 tracks, each holding 2 cars; track for building trucks, and store-room, and having transfer-table attached.
Blacksmith Shop, brick, with 8 forges, 40 feet by 76 feet, and frame addition, 40 feet by 35 feet, containing two heating furnaces and three forges.
Foundry, brick, with Cupola, having capacity of 8 tons metal in 3 hours, 40 feet by 80 feet, and framed core-room, with brick ovens, 24 feet by 24 feet.
Paint Shop, framed, two stories, 22 feet by 150 feet.
Office, brick, two stories, containing vault and 8 rooms (not in the picture).
Dry House, stone and brick, with drying shed attached (not in the picture).
Store Houses, Stable, etc., etc. (not in the picture).

The Motive Power Consists of:

A Houston Turbine Water Wheel, 80 actual horse power, with a never-failing supply of water from Spring Creek, and
Steam Power, 80 Horse.

The Machinery, Tools, &c., Consist of:

IN MACHINE SHOP AND BOILER HOUSE.

One 16x30 horizontal engine, band wheel, 8 feet diameter, 20-inch face, on a heavy, cut stone foundation.
One boiler, 54-inch diameter, 16 feet long, 60 3½-inch tubes, steam dome 30x36 inches, and all the necessary attachments.
Iron stack, 36-inch diameter, 60 feet high.
Four upright drills, No. 2. Blaisdell.
One nut tapper, 7 spindle, No. 2. Durrell's patent.
One bolt cutter, No. 5. Schlenker.
One " " double head, No. 4. Schlenker.
One " " " " No. 4. York & Smith.
One hydraulic wheel press.
One blower, "Root's," all iron, latest improvement.
One combined punch and shears for bar iron.
One large upright drill. Blaisdell.
Two vises.
One 2-wheel emery grinder.
One bolt-pointing machine.
One grindstone and frame.
One 6-foot iron planer. New Haven Mfg. Co.
One engine lathe, 18-inch swing, 10-foot bed.
One pair platform scales, 1,000 lbs. Howe.
One dozen galvanized iron fire buckets.
A large quantity of drills and other tools necessary for the work.
Two lines of shafting, with all the necessary counter shafts, pulleys and belting for the different machines.

IN FRAMING SHOP.

One horizontal tenoning machine. Atlantic Works, Phila.
One car tenoner, No. 0, vertical. Rogers, Conn.
One endless bed double surfacer and jointer. Goodell & Waters.
Three boring machines. " "
One planer, matcher and jointer. No. 2½. " "
One Lane & Bodley car mortiser, with auxiliary borer.
One car mortiser and borer, with auxiliary attachment. L. B. & O.
One gainer. London, Berry & Orton.
One horizontal borer.
One Schenck's planer and matcher.
Two cut-off saws.
Three rip saws.
One shaping machine.
One large exhaust fan.
Twenty-four galvanized iron fire buckets.
Three lines of shafting, with all the necessary counter shafts, pulleys and belting for the different machines.

IN PATTERN SHOP.

Five carpenter's benches.
One sand-papering machine.
One large jig saw.
Two wood lathes.
One cross-cut saw.
One rip saw.
Large quantity of car and other patterns.
Twelve galvanized iron fire buckets.
One line of shafting, with all the necessary counter shafts, belting and pulleys to run the different machines.

IN ERECTING SHOP.

One small portable blacksmith's forge.
One vise.
Two screw jacks.
Trestles for erecting cars.
Twelve galvanized iron fire buckets.
One pair Union scales.
With all the necessary boxing and shelves for bolts and nuts.

IN BLACKSMITH SHOP, &c.

One bolt header. Oliver Brothers and Phillips.
One power hammer. Jenkins' patent.
Twelve wrought iron anvils.
One large furnace.
Three small furnaces.
Fourteen blacksmiths' forges.
One vise.
Several tons of cast-iron forms.
A large quantity of hammers, tongs, swages, flatters, fullers, setts, chisels, etc., etc., etc.

IN FOUNDRY.

One Sturtevant blower, No. 6.
Three Reynolds molding machines, with flasks, &c., complete.
One large double emery grinder.
One 48-inch Cupola.
One pair iron platform stock scales.
Two core ovens.
One sand riddle.
Three rattlers for castings.
All the flasks, sieves, shovels, etc., etc., necessary in a foundry.

IN OFFICE.

One walnut writing table with drawers.
One high desk.
One large office desk, double, with pigeon holes.
Four office chairs.
Four high stools.
One 10 by 12 letter press.
Two coal oil lamps and fixtures.

OUTSIDE.

One pair track scales, capacity 40 tons. Howe.
Two railroad trucks.
One dump cart.
One pair wheel and axle shafts.
Eighteen wheelbarrows.
Two pairs of three sheave blocks and ¾ ropes.
Two snatch blocks.
One Weston's patent two-ton hoisting crab.
Three crowbars.
Six shovels.
One large bay horse, eight years old.
Eight large stoves.

The tools in the different departments are all new and of the most improved patterns, having been made or purchased within the last year.

The Bellefonte Car Works are advantageously situated for the supply of materials, being in the midst of oak lumber, and having a rolling mill close to their very doors.

The boiler, engine and nearly all the machinery are new, with the latest improvements and by the best makers.

The works are now employed on a large contract, are in full operation and will be so on the day of sale.

A Holly pump is attached to the motive power for fire prevention, capable of discharging 200 gallons of water per minute through an inch nozzle, with piping, hydrants and hose commanding the whole of the buildings.

The Property will be offered in two lots, namely:

Lot "A" consisting of the land, the water right, the water-wheel, the buildings, with certain exceptions, to be defined before the day of sale. It will include the line shafting, but not counter-shafting.

Lot B, consisting of all the machinery, counter shafts, with pulleys and belting, and tools in actual use, but not tools in storeroom, or office furniture, horse, harness, cart or working materials on hand.

ORDER OF SALE.

1. Lots "A" and "B" together at the upset price of 35,000
If a sale is thus effected, the auction will be ended. But if a sale is not thus effected, there will be offered
2. Lot "A" at the upset price of $28,000
3. " "B" " " 15,009

TERMS OF PAYMENT.

If lots A" and "B" are sold together:
15 per cent. on day of sale.
35 " " day of delivery.
25 " " one year from day of sale.
25 " " two years " "
With 6 per cent. per annum, payable half yearly on deferred payments.
Similar terms as to lot "A" if it is sold separately.
On lot "B," if sold separately, cash on the day of sale.

SOME REASONS FOR SELLING.

I do not live at Bellefonte; am not likely to do so; am not a practical car-builder; and am not able to give the requisite personal attention to the details of the business.

THERE WILL BE NO PRETENCE SELLING OR BIDDING.

All the property is offered for sale *on its merits. The fullest investigation* about it is cordially invited.

CONDITIONS OF SALE OF THE BELLEFONTE CAR WORKS:

1. The highest bidder to be declared the purchaser.
2. Possession to be given to the purchaser of "A" or of "A" and "B" together on the 17th day of June, 1882, under penalty of twenty-five dollars per day for any delay caused by the seller.
3. The purchaser of lots "A" and "B" together to take over all working materials, and all materials in the stores, on the date of delivery of possession, and horse, harness and cart, also office furniture and fixtures at a fair valuation, limited to three thousand dollars worth, to be paid for at the time of taking possession, and any dispute about value to be referred to a third party (to be agreed upon by the parties) whose decision shall be final. If the purchaser and seller cannot agree upon a third person, then each party is to choose one, and they two choose a third, whose decision shall be final.
4. The purchaser to give to the seller bonds for the deferred payments, with warrant of attorney, tax, insurance, attorney's commissions, 30 days' default in payment of interest or principal, and default in keeping property in repair provisions, which bonds are to be secured by a purchase money *scire facias* mortgage on the real property, plant, machinery, engine, boiler, railroad tracks, water-wheel, fixtures and tools contained in or appurtenant to the premises.
5. The purchaser, whether of lot "A" or "A" and "B" together, to insure the property and keep it insured in three insurance companies approved of by the seller to the full amount of the mortgage, and have the policies assigned to the seller or marked for his use.
6. The seller reserves the right of entry upon the premises at any time, either by himself or agent, and of examining all property, real and personal, covered by his mortgage.
7. If "B" is sold separately, it will be delivered as early as possible after the day of sale, but will not be subject to the $25 per day penalty.
8. If lots "A" and "B" are bought by different purchasers, the seller reserves the right, for three months, to remove, without being liable for damages, lot "B," or any part thereof.

For further information, and *for full Descriptive Circular, including the Auction Conditions*, apply to

MR. M. TIFFIN, Bellefonte, Pa.

Or MR. JOHN ROEBUCK, 103 Water Street, New York City.

W. LAWSON, Care Ward, Campbell & Co., New York.

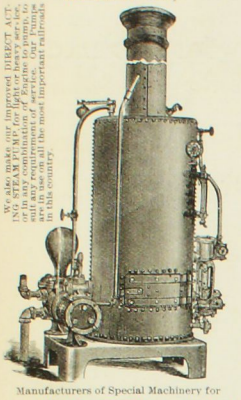
SEE BELLEFONTE CAR WORKS ADVERTISEMENTS EVERY WEEK IN "THE RAILROAD GAZETTE."

W. J. ADAM,
FENCE CONTRACTOR.

LICENSED MANUFACTURER OF
STEEL BARBED FENCE,
WIRE STAPLES, ETC.
WHOLESALER OF
Fence Tools, Iron, Oak and Cedar Posts.
Contracts for all kinds of Railroad Fencing solicited.
W. J. ADAM, Joliet, Ill.

COPE & MAXWELL MFG. CO.,
Hamilton, Ohio,

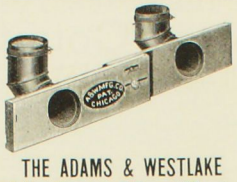
We also make our improved DIRECT ACTING STEAM PUMP, for light or heavy service, that we consider the best Pump in the world to suit any requirement of service. Our Pumps are in use on all the most important railroads in the country.



Manufacturers of Special Machinery for
R. R. WATER-STATION PUMPING.

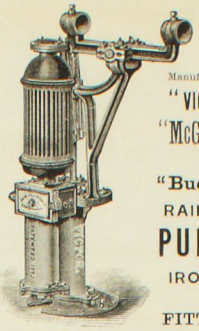
W. D. WOOD & CO.'S

PATENT PLANISHED SHEET IRON.
Patented March 14, 1865; April 8, 1873; Sept. 9, 1873; Oct. 6, 1874; Jan. 11, 1876.
Guaranteed fully equal, in all respects, to the
IMPORTED RUSSIA IRON,
And at a much less price.
LOCOMOTIVE JACKET IRON
Our Specialty.
For sale by all the principal Metal Dealers in the large cities throughout the United States, and at their office,
111 Water Street, Pittsburgh, Pa.



THE ADAMS & WESTLAKE
Window Ventilator
FOR RAILROAD OFFICES.
The only perfect device which will secure thorough ventilation. Adjustable to any size window. Each elbow contains a damper, so that the current of air can be easily regulated.
In ordering give width of the sash.
THE ADAMS & WESTLAKE MFG. CO.,
Cor. Franklin & Ontario Sts., Chicago;
45 Summer St., Boston;
7 East Fourteenth St., New York.

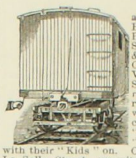
THE JOHN H. McGOWAN COMPANY,
Cincinnati, OHIO,



Manufacturers of
"VICTOR,"
"McGOWAN"
AND
"Buckeye"
RAILROAD
PUMPS,
IRON PIPE
AND
FITTINGS.

RIVAL STEAM PUMPS.
And BOILER FEEDERS.
John H. McGowan & Co., Cin'ti, O.

The Perry Safety Freight Car Coupling.



Several thousand of them are at work on the E. & T. H., C. & E. I., C., R. I. & P., T. H. & I., C., T. & M. C., St. P., M. & M., N. L. N., B. & M., Fitchburg, N. Y., P. & O., H. & C. W., Conn. R., C. V., N. Y. O. & W., N. Y., W. S. & B., and G. T. R. Railroads. Several of these roads have adopted it wholly for their freight cars. It carries its own "Stick," and with it the "Bosses" can Couple Cars with their "Kids" on.
Office of the Company, 226 La Salle Street, opposite of western entrance to Grand Pacific Hotel.
O. L. MOORE, Secretary. W. V. PERRY, Gen'l Agt.

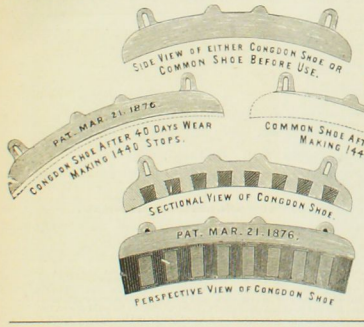
CARPETS
A SPECIALTY.

W. & J. SLOANE
Have a large line of Superior Carpetings suitable for furnishing Parlor and Sleeping Cars.
ALSO
OIL CLOTH,
COCOA and
ROPE MATS,
MATTING,
RUBBER MATS.
649, 651 and 655
BROADWAY,
N. Y.

MANGANESE BRONZE.
The best wearing metal for Locomotives and Car Axle Bearings now in use. It is as near Anti-Friction as metal can be made, while it retains all the strength of the Strongest Bronze. It is especially adapted to the use of Railroad Companies, Car and Locomotive Builders and Machinists.
MANUFACTURED BY
JOHN FITZSIMMONS, Brassfounder, 23 Carson St., Pittsburgh, Pa.

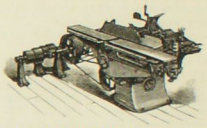
STEEL CASTINGS
FROM 1-4 TO 10,000 lbs. WEIGHT.
True to pattern, sound and solid, of unequaled strength, toughness and durability. An invaluable substitute for forgings or cast-iron requiring three-fold strength. Gearing of all kinds, Shoes, Dies, Hammer-Heads, Cross-Heads for locomotives, etc. 15,000 Crank Shafts and 10,000 Gear Wheels of this steel now running prove its superiority over other steel castings. CRANK SHAFTS, CROSS-HEADS and GEARING specialties. Circulars and Price Lists free.
CHESTER STEEL CASTINGS CO.,
Works: CHESTER, Pa. 407 Library St., PHILADELPHIA.
C. HUBBARD, Agent, 46 Cliff Street, New York.

CONGDON'S IMPROVED CAR BRAKE SHOE.



This shoe, while being more effective, in that greater uniformity of friction can be obtained when applied to the wheels of a train in motion without stopping the revolution of any till the train is at rest, exceeds in life, or the durability of the Shoe itself, that of the cast iron shoe by over seventy-five per cent.
Its durability, together with cheapness and simplicity of construction, recommend it in preference to any other in use
All communications should be addressed to
THE CONGDON BRAKE SHOE CO.,
246 CLARK ST.,
Grand Pacific Hotel Building,
Chicago,
Or Ramapo Wheel & Foundry Co.,
Ramapo, N. Y.

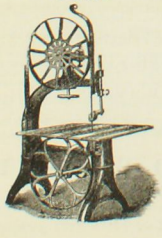
WOOD WORKING MACHINERY
UNIVERSAL WOOD-WORKERS,
PLANERS, MATCHERS,
BAND SAWS, SCROLL SAWS,
RAIL-ROAD AND CAR
MACHINERY.
BENTEL, MARGEDANT & CO.,
HAMILTON, OHIO, U. S. A.



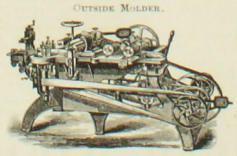
CLIMAX WOOD-WORKER.

$ $ $ $ SAVED $ $ $ $
1977 NINETEEN HUNDRED SEVENTY-SEVEN 1977
MACHINES
BOTH NEW AND SECOND-HAND
COMPRISING
MACHINE AND BLACKSMITH TOOLS OF EVERY DESCRIPTION.
WOOD-WORKING MACHINERY IN ALL ITS BRANCHES. PORTABLE ENGINES. UPRIGHT and HORIZONTAL STATIONARY ENGINES, 1 TO 300 HORSE POWER. S.C.F.&CO. LOCOMOTIVE FIRE-BOX, HORIZONTAL, and UPRIGHT BOILERS, 1 TO 100 HORSE POWER. WATER WHEELS, COTTON AND WOOLEN MACHINERY, STEAM PUMPS, GRISTMILL MACHINERY, Etc., FULLY DESCRIBED, AND PRICES ANNEXED,
☞ Send stamp for same,] In our List No. 23. [stating what you want. ☜
We have the Largest Assortment of Machinery to be found in the hands of any firm in the country.
Works and Main Office, Manchester, N. H.
S. C. FORSAITH & CO.
Branch Office and Wareroom, 209 Center street, New York City.

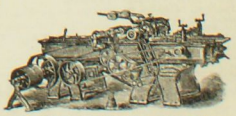
MANUFACTURERS OF WOOD-WORKING MACHINERY.



The Latest Improved
MACHINERY
for
Railroad Car Shops.



Planers, Vertical Car Tenoners, Gaining, Tenoning, Rotary Mortising Machines.



C. B. ROGERS & Co., MANUFACTORY, NORWICH, CONN.
WAREROOMS, 109 Liberty St., New York.

J. H. MONTEATH,
Importer and Dealer in
MAHOGANY & FANCY WOODS,
Office: No. 151 Centre St., New York.
Special Inducements to Car-Builders.

CAR GLASS A SPECIALTY,
"SCHANCK'S" GLASS DEPOT.—FOUNDED 1837.
THEO. W. MORRIS & COMPANY,
Importers of Plate and Sheet Glass,
27 CHAMBERS AND 3 READE STS., NEW YORK.
112 WEST 2D ST., CINN., O.
Thin Plate; Crystal Sheet, thick and flat; Embossed Work for Coaches and Sleepers; Deck Lights; Signal Colors; and all Glass required in R. R. Construction.

HOWARD IRON WORKS,
BUFFALO, N. Y.,
MANUFACTURERS OF
Schlenker's Automatic Revolving Die Bolt Cutter and Nut Tapping Machine.
SPECIALLY ADAPTED FOR RAILROAD WORK.

McIVER BROS. & CO.
SUCCESSORS OF
RICHARDSON, MERIAM & CO.,
WORCESTER, MASS.,
SPECIAL
WOOD-WORKING MACHINERY
FOR RAILROAD SHOPS AND CAR-BUILDERS.
☞ SEND FOR CATALOGUE.

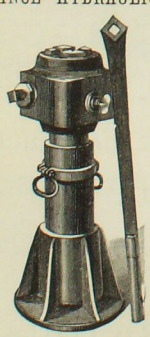
STEEL CAR PUSHER
Made entirely of STEEL.
One Man
with it can easily move a loaded car. *Will not slip on ice or grease.* For sale by
E. P. DWIGHT,
RAILROAD SUPPLIES,
407 Library St., PHILA.

Attention, Book Buyers! Big Pay to Agents!!
ENGINEERS, FIREMEN, MACHINISTS, BOILER-makers, Car-builders, and Mechanics of every class, will find in MOORE'S UNIVERSAL ASSISTANT AND COMPLETE MECHANIC, a work containing 1016 pages, 500 Engravings, 40 Tables, and over 1,000 Industrial Facts, Calculations, Processes, Secrets, Rules, etc., of rare utility in 300 Trades. A $5 book free by mail for $2.50, worth its weight in gold to any Mechanic or Business Man. AGENTS WANTED. Sure sale everywhere, for all time. For Ill. Contents Pamphlet, Terms, and 128 page Catalogue of 300 Practical Books, address NATIONAL BOOK CO., 23 Beekman street, New York.

FOR SALE.
200 Sets Steel Stamping Figures and Alphabets, Fully Warranted.
Gothic Figures, ⅛ in. or less, $1 per set; 3-16 in., $1.50; ¼ in., $2; 5-16 in., $2.50; ⅜ in., $3 per set. Alphabets three times as much. Old stamps repaired and new ones made promptly. Send for price list. CLEVELAND STAMP AND DIE CO., 125 Champlain street, Cleveland, Ohio.

PORTLAND, ROMAN AND KEENE'S CEMENT.
FIRE-BRICK, ASPHALTE, ART, DECORATIVE, AND ENCAUSTIC TILING
S. L. MERCHANT & CO.,
41 Broadway, New York City.
Remit 50 cents in postage stamps for "Treatise on Cement," showing how to mix it and how to use it.

THE
"RELIANCE" HYDRAULIC JACK

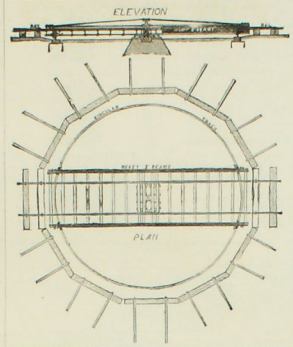


SIMPLE IN CONSTRUCTION AND DURABLE,
Manufactured of Selected Material in the most thorough manner.
Lowering valve worked by thumb screw, giving operator perfect control in lowering. Pump plunger guided top and bottom, insuring perfect working.
PHILIP S. JUSTICE,
14 N. 5th Street - - Philadelphia.

MORSE TWIST DRILL AND MACHINE COMPANY

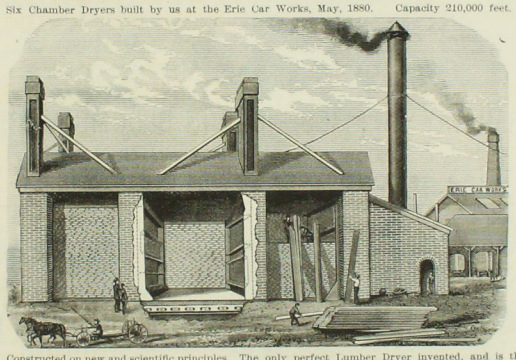
MANUFACTURES
Patent Twist Drills, Machine Bits for Wood, Bit Stock Drills, Reamers, Standard Gauges, Milling Cutters and Special Tools, for use in Railroad, Car and Locomotive Shops. NEW BEDFORD, Mass.

R. D. THORNBURGH, Pres't. NORRIS B. GREGG, Sec'y.
MOUND CITY PAINT AND COLOR CO.,
ST. LOUIS, MO.,
MANUFACTURE
FINE RAILWAY AND COACH VARNISHES.
Colors, Dry, in Oil and Ground in Japan.
FREIGHT CAR AND BRIDGE PAINTS READY FOR USE.



NEW
LOCOMOTIVE TURNTABLE.
This cut represents a recently patented wrought iron turntable of simple construction, and easily adjustable to height by a center pivot screw, and made with special reference to avoiding a deep pit, as in present turntables—thus saving the cost of circular retaining wall, consequent draining, and the filling up with snow and ice. The longitudinal trusses are made of I or other shaped beams of great strength, and can be operated by one man. Address:
WILCOX & STOCK
TOLEDO, O.

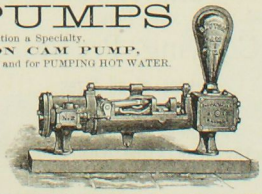
THE INVINCIBLE LUMBER DRYER.
PATENTED IN THE UNITED STATES AND CANADA.
Six Chamber Dryers built by us at the Erie Car Works, May, 1880. Capacity 210,000 feet.



Constructed on new and scientific principles. The only perfect Lumber Dryer invented, and is the cheapest and best in the market. Adapted to any size from 10,000 feet capacity up. Send for illustrated Catalogue of all sizes. We secure all parties we build for against infringement. THE INVINCIBLE LUMBER DRYER CO., P. G. FINN, Manager, 20 N. Park Row, Erie, Pa. BURDSALL & CRAWFORD, Agents, 11 State Street, Chicago, Ill

C. L. P. CO. TRADE MARK
CLEVELAND IRON ORE PAINT COMPANY,
Manufacturers of
PURE IRON ORE PAINTS,
Red (Rossie) Purple and Brown.
We guarantee all our Paints, and respectfully solicit the patronage of consumers and dealers. Send for price-list.
Office, 79 Columbus St., Cleveland, O.
Our Paints are used largely by the Railroads and Car Builders of our country.
BEST IRON PAINT.

STEAM PUMPS
For Boiler Feeding and Fire Protection a Specialty.
THE IMPROVED DAYTON CAM PUMP,
Designed and built especially for BOILER FEEDING and for PUMPING HOT WATER.
Steam Pumps and Hydraulic Machinery
For Railroad Purposes.
The Combined Pump and Boiler, with Removable Water Cylinder.
The MOST POWERFUL FIRE PUMPS ever made. Every machine warranted. Over 1,800 in use. Send for Descriptive Circulars.
SMITH, VAILE & CO., Dayton, O.
CHICAGO HOUSE, 24 WEST LAKE STREET.



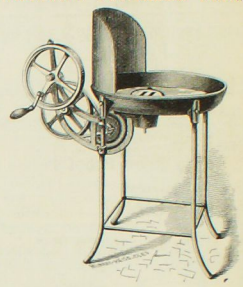
CHAINS
UNION CHAIN WORKS
REITER & CO.,
MANUFACTURERS OF ALL KINDS OF CHAINS
BRAKE CHAIN A SPECIALTY.
Twenty-Ninth and Railroad, Pittsburgh, Pa.

E. W. VANDERBILT. E. M. HOPKINS.
VANDERBILT & HOPKINS,
RAILROAD TIES, CAR AND RAILROAD LUMBER, WHITE AND YELLOW PINE AND OAK.
No. 120 Liberty St., N. Y.
Also North Carolina Pine Boards. Plank and Dimension Lumber to Order.
GENERAL RAILROAD SUPPLIES.

J. BERNARD.
MANUFACTURER OF
Marqueterie of every description; dealer in French Walnuts, Colored and any other Veneers, especially adapted for Car-Work.
161 Greene Street, N. Y.

H. B. SMITH MACHINE CO.
925 MARKET ST.
PHILADELPHIA
CELEBRATED
WOOD WORKING
MACHINERY
For Car Shops, Planing Mills, etc., etc. Also, Machinery for All Purposes. Correspond with us.

CLEVELAND STEAM GAUGE CO.,
SOLE PROPRIETORS AND MANUFACTURERS OF
WATSON'S PORTABLE FORGE,

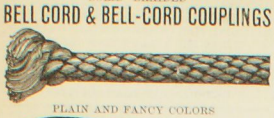


Watson's Forge Blower, Watson's Barrel Filler,
HOLT'S PATENT STEAM GAUGES
For Locomotives and Stationary Engines.
Locomotive Spring Balances. Test Pumps and Test Gauges.
Send for Circular and Price List.
WORKS: 13, 15 AND 17 WEST STREET.
Office: 211 Superior St., CLEVELAND, O.

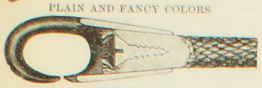
STEEL CASTINGS.
RAIL-ROAD AND MACHINE CASTINGS OF ALL KINDS FROM ½ LB TO 10 TON.
LOCOMOTIVE CROSS HEADS AND GEARING A SPECIALTY.
EUREKA CAST STEEL CO.
No 307 WALNUT ST. PHILAD.A.
WESTERN OFFICE 45 LA SALLE ST CHICAGO, ILL.

RAILWAY MACHINERY AND SUPPLIES.
L. G. TILLOTSON & CO.,
MANUFACTURERS OF
Railway Car Findings.
PLUSH IMPORTERS.
RUBBER GOODS,
COTTON WASTE.
DEALERS IN
RAILWAY SUPPLIES
OF EVERY DESCRIPTION.
Nos. 5 and 7 Dey Street, New York.

SOLID BRAIDED
BELL CORD & BELL-CORD COUPLINGS

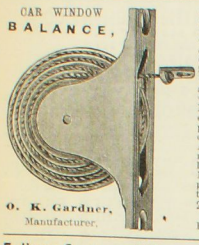


PLAIN AND FANCY COLORS



MANUFACTURED BY
SILVER LAKE CO.
WELLINGTON BROS. & CO., Agents, BOSTON.

CAR WINDOW
BALANCE,



for Passenger Coaches, Sleeping and Parlor Car Windows, consisting of Cone and Coil Spring with Wire Cord, balancing the weight of sash. Noiseless in operation, and placed entirely out of sight. Adopted by many of the leading roads. No car complete without them.

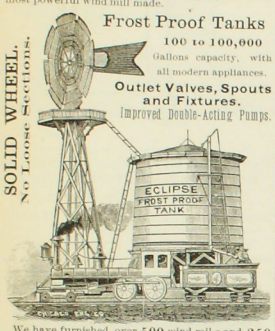
O. K. Gardner, Manufacturer. 28th and Railroad Sts., Pittsburgh, Pa.

Eclipse System of Water Supply for Railroads.

ECLIPSE SOLID WHEEL WIND MILLS.

Tested 14 years. Perfectly self-regulating. Conceded by the leading railway companies of this and other countries to be by far the strongest, safest and most powerful wind mill made.

SOLID WHEEL. No Loose Sections.



Frost Proof Tanks
100 to 100,000
Gallons capacity, with all modern appliances.
Outlet Valves, Spouts and Fixtures.
Improved Double-Acting Pumps.

We have furnished over 500 wind mills and 250 complete water stations in 1881 to the leading railroads in the United States and Canadas. Two mill iron feet of tank lumber constantly on hand. Our capacity is such that we can execute large orders promptly. Complete stations erected on trial when desired to test the correctness of our claims. Send for catalogue and price-list.

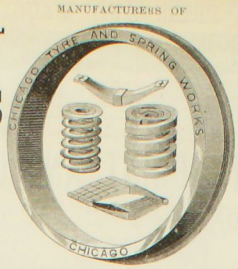
ECLIPSE WIND ENGINE CO.
W. H. WHEELER, Manager,
BELOIT, WIS.

The Sheffield Velocipede Hand-Car.

This Hand-Car is especially adapted to the use of **Road-Masters, Bridge Inspectors, Telegraph Line Repairers, Track Inspectors, Track Walkers, Wood** and **Tie Inspectors,** and for all work where one or two men wish to go over the line at will. Also, our Telegraph Cars, capable of carrying two men and material. Light, Easily Handled, and when ready for shipment occupy very little space in Baggage Car—a great advantage to railroad men. Run easily, being propelled by the **ROWING MOVEMENT.** Can be run short distances at the rate of **20 Miles an hour; and will not jump the track.**

HENRY W. PEABODY & CO.,
114 STATE STREET, BOSTON,
GENERAL PURCHASING AGENTS
For Foreign Railway and Tramway Companies

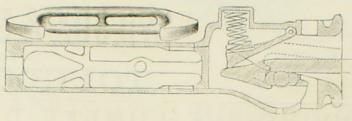
MANUFACTURERS OF
CAST STEEL
LOCOMOTIVE
TYRES
Any specification.
Works at
MELROSE.
ILL.



CAST STEEL
CAR
SPRINGS
of every description.
Office,
157 WASHINGTON ST.,
CHICAGO,
ILL.

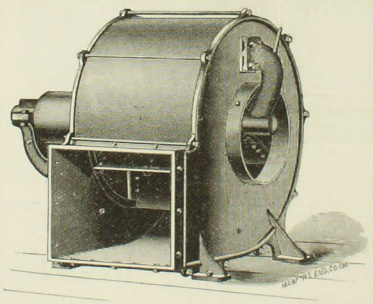
F. M. ATKINSON, Pres. C. H. FERRY, Treas.

MANUFACTURERS OF
RAILWAY SPRINGS.
18th and Pennsylvania Ave.,
PHILADELPHIA, PA.
H. L. LEACH, Agt., 77 Water St., BOSTON, MASS.



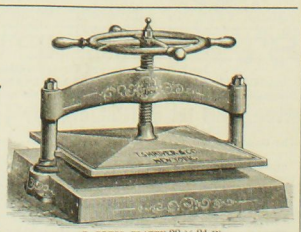
The above cut shows a sectional view of the WAPAKONETA AUTOMATIC CAR-COUPLER AND HOOK. This Coupler can be used where any continuous Draw-bar is used, without incurring any additional expense for change. Cars can be uncoupled without any slack in train. These Couplers are made of the best Refined Air-Furnace Malleable Iron, and Hook of Cast Steel. For further information, address either WAPAKONETA AUTOMATIC CAR COUPLER CO., Wapakoneta, Ohio, Or JOHN COUP, Agent, P. O. Box 29, Cleveland, O.

IRON CITY SCRAP METAL CO.,
DEALERS IN
RAILWAY SUPPLIES, PIG IRON, BLOOMS & ORE,
Old Rails, Scrap Iron, Steel, Etc.,
229 SECOND AVENUE, PITTSBURGH, PA.



BENJAMIN, FISCHER & MALLERY,
MANUFACTURERS OF
WOOD-WORKING
MACHINERY.
SPECIALTIES:
Triumph Planing Machines, Single and Double Surfacers, Siding and Re-sawing Machines, Shaving Exhausters and Automatic Knife Grinders.
ESTIMATES GIVEN
on Engines, Boilers, Pumps, Heaters, Pulleys and Hangers.
Address
BENJAMIN, FISCHER & MALLERY,
26 S. Canal St., Chicago, Ill.
WORKS:
22 and 24 S. Jefferson Street.

SHRIVER'S
NEW YORK
Copying Presses.
Presses of all Sizes,
From the Smallest to the Largest, in use by
RAILROAD, EXPRESS AND TRANSPORTATION COMPANIES.
T. SHRIVER & CO.,
333 E. Fifty-Sixth St., New York.



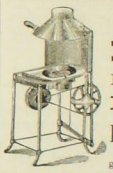
R. PRESS, PLATEN 22 × 24 IN.

CRANE BROS. MANUFACTURING CO.,
CHICAGO,
MANUFACTURERS OF
STANDARD WEIGHT | LAP-WELD | WROUGHT-IRON
PIPE,
Brass and Iron Goods
For Steam and Gas-Fitters and Engine Builders.
Cast Iron and Malleable Iron Fittings,
STEAM PUMPS,
Hollow Stay-Bolt Iron, Babbitt Metal, &c.

W. R. BURT,
Buffalo, N. Y.
ADDRESS,
P. O. Drawer 266.
Manufacturer of Michigan Pine Lumber, Car Siding, Boarding, etc.
East Saginaw, Mich.
Planing Mill & Yard
Buffalo, N. Y.

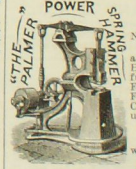
DELL NOBLIT. JOSEPH C. NOBLIT. THOS. HOYE.
DELL & JOSEPH C. NOBLIT & CO.,
IMPORTERS AND MANUFACTURERS OF
UPHOLSTERY GOODS
AND
CABINET HARDWARE,
RAILROAD & STEAMBOAT SUPPLIES
Plushes, Burlaps, Springs, Hair, Moss, etc., etc., especially adapted for Railroad Cars.
Nos. 220 and 222 South Second Street,
PHILADELPHIA.
335 BROADWAY, NEW YORK.

RAILWAY SUPPLIES.
H. L. LEACH,
NEW ENGLAND AGENT
FOR
Nathan & Dreyfus—Oilers and Lubricators and Freidmann's Injectors and Ejectors; C. W. Pickering & Co.—Locomotive and Car Springs.
Boiler Tubes, Plate Iron and Steel Boilers, Tanks, Machinists' Tools, Locomotive Frames, Crank-Pins, Axles, Head Lights, Steam Gauges, Car Wheels Etc., Etc.
77 WATER STREET, BOSTON, MASS.



HOLT FORCES
REVOLUTION IN PRICES
FORGES - $10
Former Prices - $23
For particulars and photographs address
HOLT MANUFACTURING CO.
CLEVELAND, O.

THIS HAMMER
AWARDED THE FIRST PREMIUM OF A SILVER MEDAL AT THE American Institute Fair, N. Y. CITY, NOV., 1873.

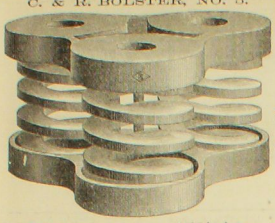


Superior in every point to any modification of the Trip Hammer. Simple, Powerful, Efficient and Cheap. Four sizes now being built. For Prices and Descriptive Circulars, address the manufacturers.
S. C. FORSAITH & CO.,
Manchester, N. H.,
who are also builders of the Abbe Bolt-Heading Machine.

BOUND VOLUMES OF
THE CAR-BUILDER
For 1880 and 1881. Price, $3 each.
National Car-Builder,
5 Dey Street.

EWALD IRON COMPANY, OWNERS AND OPERATORS OF
TENNESSEE ROLLING WORKS,
Manufacturers of the Well-Known Tennessee Charcoal Bloom Boiler Plate, Flange, Fire-Box, Sheet, Bar and Stay Bolt Iron.
OFFICE, 801 NORTH SECOND STREET, ST. LOUIS, MO.

C. & R. BOLSTER, NO. 5.



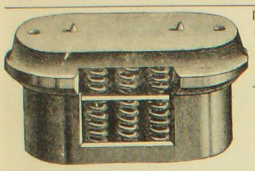
Diameter.....11½ inches.
Height.....6¼ "
Capacity, each spring, 30,000 lbs.

CLIFF, & RIGHTER CO.
(LIMITED),
MANUFACTURERS OF
Railway Car Springs.
NO. 5 DEY STREET,
NEW YORK.

DIAMOND STATE CAR SPRING WORKS.

Manufacturers of Elliptics, Locomotive and Improved Flat and Round Bar
NEST SPRINGS,
Of the Best Grade of Cast Spring Steel.
JAMES P. HAYES.

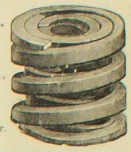
Jas. P. Hayes & Co.,
WILMINGTON, DEL.
SPIRAL SPRINGS
Of Every Description.
JAMES C. FICKELS.



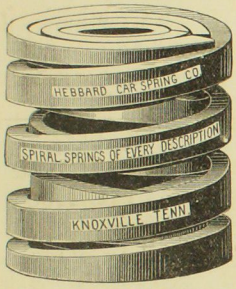
The Celebrated "Davis" Car Spring,
MANUFACTURED AND FOR SALE BY
A. B. DAVIS CAR SPRING CO.
(Limited),
S. W. Cor. 23d and Hamilton Sts.,
PHILADELPHIA.
CHICAGO OFFICE, 100 LAKE ST.

JAMES JEFFRIES & SONS,
MANUFACTURERS OF
ELLIPTIC & HALF ELLIPTIC CAST-STEEL SPRINGS,
For Railroad Cars and Locomotives.
813 JAYNE STREET, PHILADELPHIA, PA.

COLUMBIA CAR SPRING CO.,
322 SEVENTH AVENUE,
Cor. Twenty-eighth St., NEW YORK.
BRANCHES:
36 Dearborn Street, Chicago, Ill.
713 N. Second Street, St. Louis, Mo.
208 South Fourth St., Philadelphia, Pa.
109 Milk Street, Boston.
123 Central Avenue, Cincinnati.
16 S. Howard Street, Baltimore, Md.
F. H. ANDREWS, President and Treasurer.
B. A. CLOONEY, Sec. and Gen'l Sup't.



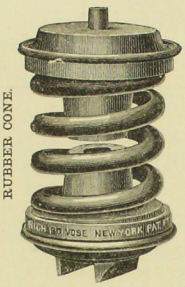
HEBBARD CAR SPRING CO.,
MANUFACTURERS OF
Steel Spiral Car Springs
OF EVERY DESCRIPTION,



Knoxville, Tenn.

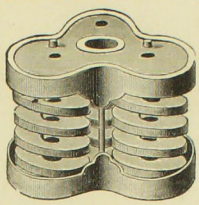
NATIONAL
Car Spring Company.
RICHARD VOSE, President.
NEW YORK: 13 Barclay St.
CHICAGO: 184 & 186 Washington St.
ST. LOUIS: 714 N. 2d St.
PHILADELPHIA: 208 Walnut St.

VOSE GRADUATED EQUALIZER RUBBER CONE.

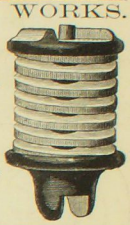


Adapted to a Car-Body Weighing 20,000 Lbs.
Height, Bearing to Bearing, 11¼ in.
Diameter outside Casting, 8 in.

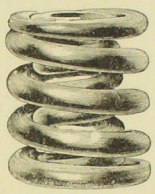
KEYSTONE CAR SPRING WORKS.



EDGE ROLLED
SPIRAL DRAW BOLSTER
AND
EQUALIZING SPRINGS.
AND
SPIRAL SPRINGS
OF ALL DESCRIPTIONS.

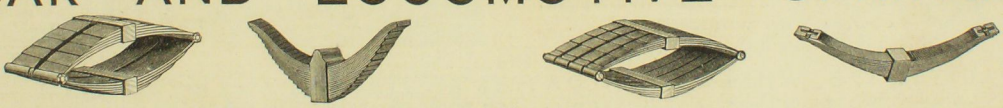


CHARLES SCOTT,
MANUFACTURER,
1,016 and 1,018 New Market St.,
PHILADELPHIA, Pa.

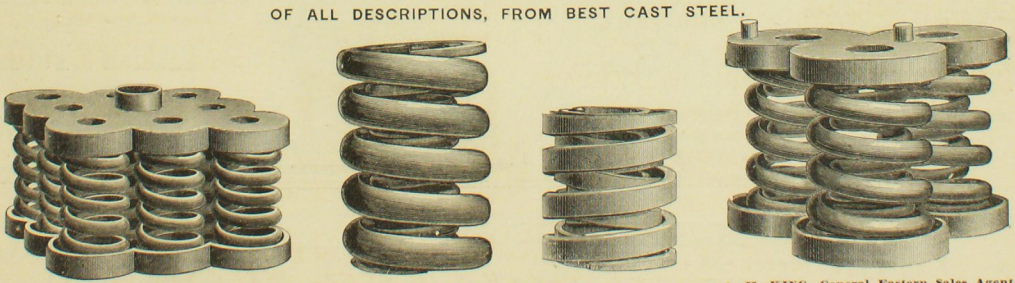


French Spiral Spring Co.
LIMITED,
SPIRAL RAILWAY CAR SPRINGS,
Street Car, Buffer, Freight Bolster,
Journal and Equalizing Bar Springs.
Brake Release, Switch, Valve and Machinery Springs.
AARON FRENCH, CHAIRMAN. CALVIN WELLS, DIRECTING MANAGER.
GEO. W. MORRIS, SEC'Y. FRANK S. LAYNG, TREAS.
WALTER P. HARRELL, SUP'T.
Corner of Twenty-Sixth and Liberty Streets, PITTSBURGH, PA.
NEW YORK: 115 Broadway, Room 91, H. A. LITTLE, Agent.
CHICAGO: Room 6, Ashland Block, ROBERT WASON, Agent.
ST. LOUIS: M. M. BUCK & CO. Agents.

DETROIT CAR SPRING COMPANY,
MANUFACTURERS OF
OIL TEMPERED ELLIPTIC RAILWAY
CAR AND LOCOMOTIVE SPRINGS.



ALSO
SPIRAL, ROUND, FLAT AND EDGE ROLLED SPRINGS
OF ALL DESCRIPTIONS, FROM BEST CAST STEEL.



ALEX. DE LANO, Treasurer and Manager.
DETROIT, MICH.
H. R. NEWBERRY, Secretary.
A. H. KING, General Eastern Sales Agent.
New York Office, 46 CORTLANDT ST.

PARROTT VARNISH COMPANY,

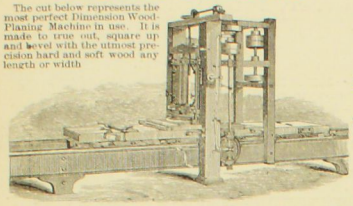
MANUFACTURERS OF FINE

RAILWAY VARNISHES,

BRIDGEPORT, CONN.

DANIELS PLANERS.

The cut below represents the most perfect Dimension Wood-Planing Machine in use. It is made to true out, square up and bevel with the utmost precision hard and soft wood any length or width



WOOD-WORKING MACHINERY,

MANUFACTURED BY

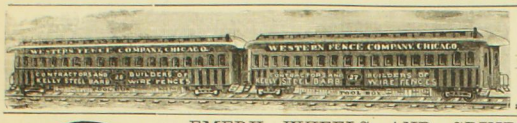
WITHERBY, RUGG & RICHARDSON, Worcester, Mass.,

26 SALISBURY STREET. (Shop formerly occupied by R. BALL & CO.

SPECIALTIES:

Woodworth Planing, Tonguing and Grooving Machines, Daniels Planers, Richardson's Patent Improved Tenon Machines, Mortising, Molding, Re-saw and Band Saw Machines, Picture Frame and Miter Cutting Machines, Box Machinery,

PATENT DOUBLE SAW BENCHES, SAW TABLES, &c.



WESTERN FENCE COMPANY,

CONTRACTORS AND BUILDERS OF

RAILWAY BARB WIRE FENCES.

☞ 1,500 miles of Fence built by us in 1880 and 1881. Contracts taken for 50 miles and upwards. Apply for estimates. 15 to 21 North Clinton St., CHICAGO, ILL

EX INUTILI UTILITAS TRADE TANITE MARK

EMERY WHEELS AND GRINDING MACHINES.

THE TANITE CO.,

Stroudsburg, Monroe County, Pa.

Orders may be directed to us at any of the following addresses, at each of which we carry a stock:

New York, 42 Dey St.
Chicago, 153 and 154 Lake St.
" 40 Franklin St.
Minneapolis, 254 Second Av., South
Philadelphia, 925 Market St.
Boston, cor. High and Oliver Sts.
St. Louis, 209 North Third Street.
" " 811 to 819 North Second St.
Cincinnati, cor. Pearl and Plum Sts.
Pittsburgh, 137 First Avenue.
Indianapolis, Maryland & Delaware Sts.
New Orleans, cor. Union & St. Charles Sts.
San Francisco, 2 and 4 California St.
Portland, Oregon, 43 Front St.
Liverpool, Eng. 42, The Temple, Dale St.
Sydney, N. S. W., 17 Pitt St.

Emery Rolls for Car Brass Grinding.
Special Wheels for Phosphor-Bronze Boxes.
Automatic Car Brass Grinder.
Locomotive Slide Bar Grinder.

* * * * * * * * * *

Important Specialty, Emery Wheels to grind Chilled Car Wheels. We sell to the actual user at unusually low prices. These wheels cannot be bought of any agent or dealer.

CURLED HAIR.
GLUE.
SAND PAPER.
EMERY CLOTH.

MANUFACTURED BY

BAEDER, ADAMSON & CO.

New York, 67 & 69 Beekman St.

PHILADELPHIA, 730 MARKET STREET.
BOSTON, 143 MILK STREET.
CHICAGO, 182 LAKE STREET.
CINCINNATI, 8 & 10 WEST PENN ST.

FELTING FOR REFRIGERATOR CARS AND BOILERS.

PALMER, PARKER & CO.,

MAHOGANY AND VENEERS,

AND ALL FOREIGN AND DOMESTIC CABINET WOODS.

MILL AND WAREROOMS:

PORTLAND, Cor. TRAVERS ST., BOSTON, MASS.

Send for Price List.

VAN LIEW'S GRAIN-DOOR PATENTS.

Refers to thousands of cars on the following roads: A., T. & S. Fe; C. & A.; C., B. & Q.; C. & N. W.; C., St. P., M. & O.; Grand Trunk; K. P.; Mo. Pac.; Pa.; P., F. W. & C.; P., C. & St. L.; Tex. & Pac.; W., St. L. & P.

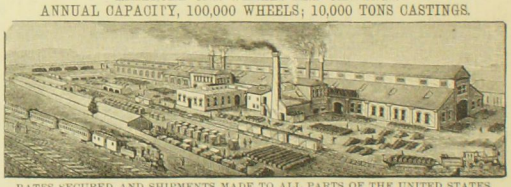
All work to be made from STANDARD PATTERNS furnished by **D. F. VAN LIEW, Patentee, Box 172, Aurora, Ill.**

Viz.: "STANDARD," "CIRCLE AND LUG," "BISSELL & MILLER," "NAIL-PROOF," "BARKER & THOMAS," and "SOCKET" Patents.

GRIFFIN CAR WHEEL CO.

RAILROAD CAR WHEELS AND CASTINGS.

ANNUAL CAPACITY, 100,000 WHEELS; 10,000 TONS CASTINGS.



RATES SECURED AND SHIPMENTS MADE TO ALL PARTS OF THE UNITED STATES. SPECIAL ATTENTION GIVEN TO CAR AND ENGINE WHEELS FOR RAILROAD USE. MILEAGE GUARANTEED. CONTRACTS MADE FOR YEARLY OR OTHER SUPPLY. CORRESPONDENCE SOLICITED.

OFFICE AND WORKS: Cor. Foundry St. and Michigan Central R. R., DETROIT, MICH.

GRIFFIN & WELLS FOUNDRY CO.,

MANUFACTURERS OF

CAR, TRUCK AND TENDER WHEELS.

OFFICE AND WORKS,

Paulina, South of Blue Island Ave., Chicago.

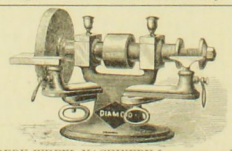
CAPACITY, 175 WHEELS PER DAY.

D. A. WELLS, President. T. A. GRIFFIN, Gen'l Manager. A. G. WELINGTON, Secretary.

PENFIELD BLOCK CO.

Pulley Blocks and Iron Sheaves, Phosphor-Bronze Self-Lub. Sheaves, Cushers, Giant Car, $5.00 each. See Poor's Manual, 1880-81. See p. 53. Please write for lists, prices, etc.

LOCKPORT, N. Y.



EMERY WHEEL MACHINERY from new and improved designs.

DIAMOND SOLID EMERY WHEEL.

Hadley's Pat. Counter Shaft and Belt Shifter.

Send for illustrated catalogue and prices.

Diamond Emery Wheel & Machine Co., Providence, R. I. 275 So. Canal st., Chicago; 800 No. Second st., St. Louis; 316 Robert st., St. Paul; 11 So. Water st., Cleveland.

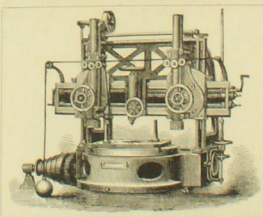
TAPS, DIES AND GAUGES,

U. S. OR SELLERS & WHITWORTH STANDARD.

THE PRATT & WHITNEY CO.

Hartford, Conn.

Illustrated Catalogues and Price Lists furnished on application.



NILES TOOL WORKS,

Hamilton, Ohio.

MACHINE TOOLS

FOR

Railroad, Locomotive and Car Shops.

ALL FROM NEW AND IMPROVED PATTERNS

PRICES AND PHOTOGRAPHS ON APPLICATION.

MANUFACTURERS OF BOLTS.

SEND FOR PRICE LIST.

PLUMB BURDICT & BARNARD BUFFALO N.Y.